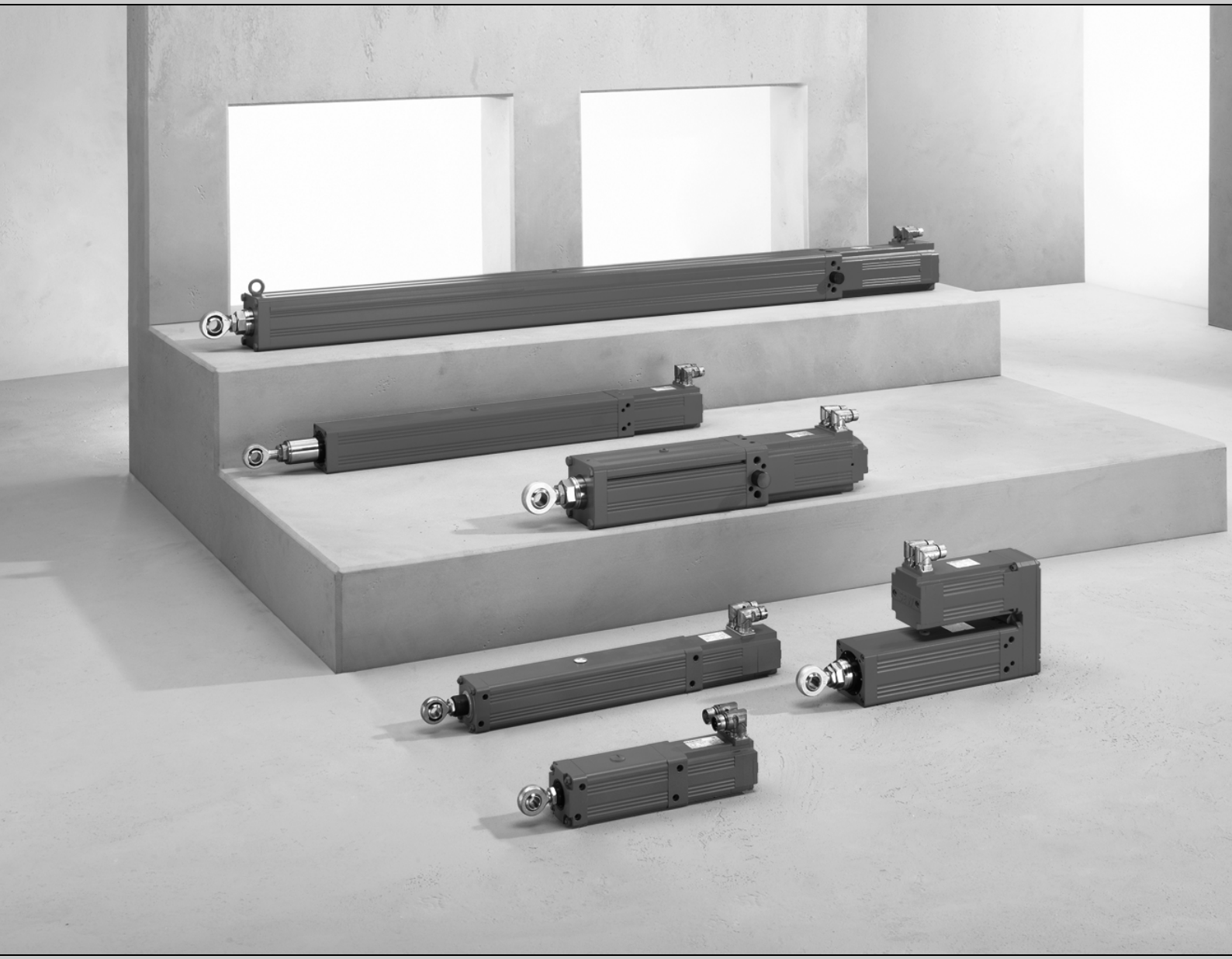
SEW EURODRIVE

Operating Instructions

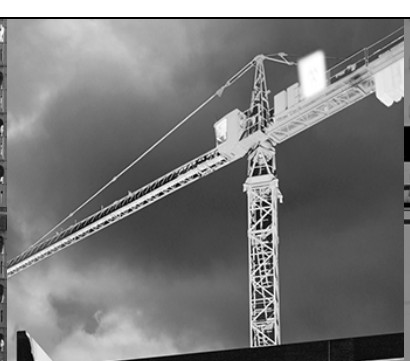


Electric Cylinders

CMS..50 – 71

Edition 03/2013

20071345 / EN



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1 General Information

1.1 How to use this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, start up, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes, warnings regarding potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER**	Imminent danger	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Structure of the section safety notes

Section safety notes do not apply to a specific action but to several actions pertaining to one subject. The symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a section safety note:

⚠ SIGNAL WORD

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.

1.2.3 Structure of the embedded safety notes

Embedded safety notes are directly integrated in the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- **SIGNAL WORD** Type and source of danger.

  Possible consequence(s) if disregarded.

  – Measure(s) to prevent the danger.

1.3 Rights to claim under warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Therefore read the documentation before you start working with the unit.

1.4 Exclusion of liability

You must comply with the information contained in this documentation to ensure safe operation and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

1.5 Copyright

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Unauthorized duplication, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and adhered to. Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

2.1 Preliminary information

The following safety notes are concerned with the use of CMS electric cylinders.

Also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information

⚠ WARNING

Danger of fatal injury or risk of injury during the operation of motors or gearmotors caused by live, bare (in the event of open connectors/terminal boxes) and movable or rotating parts.

Risk of burns caused by hot surfaces

Severe or fatal injuries

- All work related to transport, storage, installation, assembly, connection, startup, maintenance and repair may only be carried out by qualified personnel.
- For transport, storage, installation, assembly, connection, startup, maintenance and repair it is important that you adhere to the information in the following documents:
  - Warning and safety signs on the motor/gearmotor
  - All the project planning documents, startup instructions and wiring diagrams related to the drive
  - System-specific regulations and requirements
  - National/regional regulations governing the safety and prevention of accidents
- Never install damaged products.
- Never operate or energize the unit without the necessary protection covers or housing.
- Use the unit only for its intended purpose.
- Make sure the unit is installed and operated properly.

INFORMATION

In the event of damage caused by transport, submit a complaint to the shipping company immediately.

This documentation provides additional information.

2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting and servicing of the product who possess the following qualifications:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

Any electronic work may only be performed by adequately qualified electricians. Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting and servicing of the product who possess the following qualifications:

- Training in electrical engineering, e.g. as an electrician, electronics or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

All work in further areas of transportation, storage, operation and waste disposal must only be carried out by persons who are trained appropriately.

All qualified personnel must wear appropriate protective clothing.

2.4 Designated use

CMS electric cylinders are drive motors designed for use in industrial and commercial systems. Motor utilization other than that specified and areas of application other than industrial and commercial systems can only be used after consultation with SEW-EURODRIVE.

The CMS electric cylinders meet the requirements of EC directive 2006/95/EC (low voltage directive). Do not take the unit into operation until you have established that the end product complies with the EC Machinery Directive 2006/42/EC.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.

2.5 Other applicable documentation

The following publications and documents have to be observed as well:

- Wiring diagrams available from SEW-EURODRIVE
- Catalog "Electric Cylinders CMS..50 – 71"
- Operating instructions "Synchronous Servomotors CMP41 – 63, CMP.71 – CMP.100"
- Catalog "Synchronous Servomotors"

2.6 Transport / storage

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately about any damage. It may be necessary to preclude startup.

Tighten the eyebolts securely. They are designed for the weight of the electric cylinder only; do not attach any additional loads.

The installed lifting eyebolts are in accordance with DIN 580. The loads and regulations specified in that document must always be observed. If the electric cylinder is equipped with two eyebolts, then both of these should be used for transportation. In this case, the tension force vector of the slings must not exceed a 45 angle in accordance with DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Reattach these in the case of further transportation.

Store the electric cylinder in a dry, dust-free environment if it is not to be installed straight away. The electric cylinder can be stored for one year without requiring any special measures before startup.

2.7 Installation

Also adhere to the information in chapter "Mechanical installation (page 19)" and "Electrical installation (page 37)".

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the electric cylinders from excessive strain. Ensure that components are not damaged, particularly during transportation and handling.

The following applications are prohibited unless explicitly permitted:

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.

2.8 Electrical connection

All work may only be carried out by qualified personnel. During work, the low-voltage machine must be at standstill, de-energized, and safeguarded against accidental restart. This also applies to auxiliary circuits (e.g. anti-condensation heating or forced cooling fan).

Check whether the unit is de-energized!

Exceeding the tolerances in EN 60034-1 (VDE 0530, part 1) - voltage + 5%, frequency + 2%, curve shape, symmetry - increases the heating and influences electromagnetic compatibility. Also comply with EN 50110 (where necessary, observe other applicable national regulations, such as DIN VDE 0105 for Germany).

Observe the wiring information and differing data on the nameplate as well as the wiring diagram provided with the motor.

The connection must be a permanently secure electrical connection (no protruding wire ends):

- Use the corresponding cable end equipment.
- Establish a secure protective earth connection.

When the motor is connected, the distances to non-insulated and live parts must not be shorter than the minimum values according to IEC 60664 and national regulations. With low voltage, the distances should be no shorter than the following values, in compliance with IEC 60664:

Nominal voltage V_N	Distance
≤ 500 V	3 mm
≤ 690 V	5.5 mm

The terminal box must be free from foreign objects, dirt and humidity. Unused cable entry openings and the box itself must be closed so that they are dust- and water-proof. Secure the key for test mode without output elements. When operating low-voltage machines with brakes, check that the brake is functioning correctly before startup.

2.9 Startup/operation

Whenever changes to normal operation occur, such as increased temperatures, noise, vibrations, etc., you should determine the cause. Consult the manufacturer if required. Never deactivate protection devices, even in test mode. Switch off the motor/electric cylinder if you are not sure.

Regularly clean air ducts in dusty or dirty environments.

2.9.1 Surface temperature during operation

Servomotors/brakemotors/electric cylinders get very hot during operation.

Touching the servomotor/brakemotor/electric cylinder when it has not cooled down could result in burns. The servomotor can have a surface temperature of more than 100 °C during operation.

Never touch the servomotor/brakemotor/electric cylinder during operation or in the cool down phase after it has been switched off.

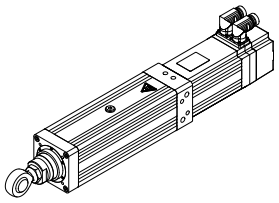
3 Electric Cylinder Design

3.1 Designs

There are now two different CMS types:

- CMS standard
- CMSM modular

3.1.1 CMS standard



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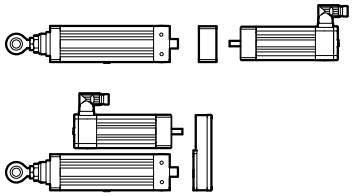
The basic servomotors (CMP) are mounted directly as before.

3.1.2 CMSM modular



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5303563915

For the modular type, the linear units can be mounted to a basic servomotor (CMP) of size 63 or 71 by means of an adapter (axes either in parallel or in series).

The letter "M" in the type code stands for modular design.

3.2 "Generation" characteristic

The type designation now also contains the characteristic "Generation". to distinguish different versions. It is used to indicate a further development of the product in the type designation.

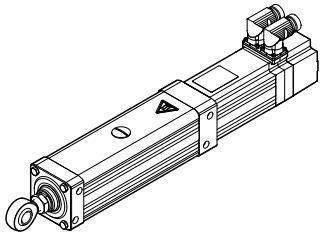
All drives with oil bath technology are drives of generation "B".

The CMS63 cylinder is now given the new designation "CMSB63", whereas the existing CMS50 and CMS71 cylinders with grease lubrication keep their previous type designation.

3.3 Sizes

SEW-EURODRIVE offers **4 product variants**:

3.3.1 CMS50



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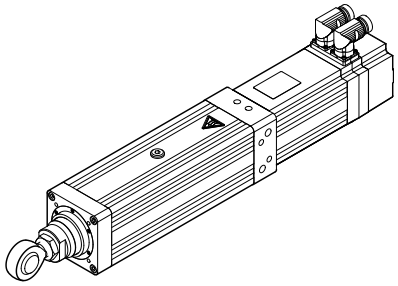
3.3.2 CMSB63/71



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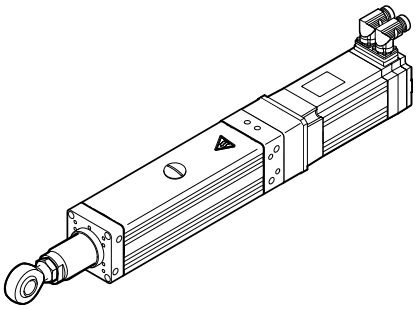
3.3.3 CMSMB63/71

/ACH /ACA



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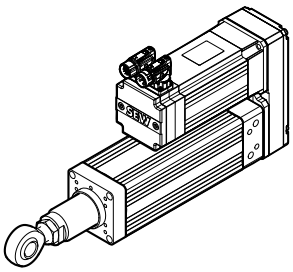
/AP



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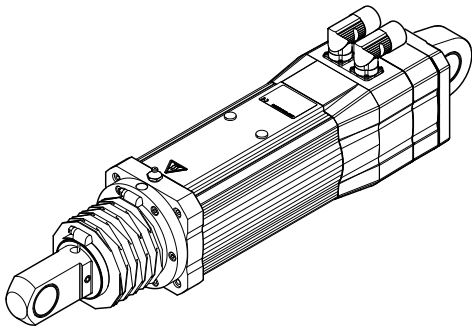
3.3.4 CMS71



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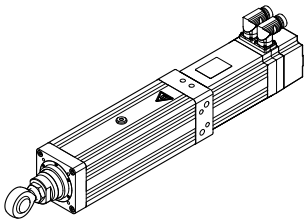
3.4 CMS... type designation

The following diagram shows a type designation of an electric cylinder:



CMS B 71L/ BP /KY /RH1M /SB1 /VR

Ventilation
- VR = Forced cooling fan

Plug connector
- /SM1 = Motor
- /SB1 = Brakemotor
- /SX1 = Special plug

Encoder system
- /RH1M = Resolver, 2-pole
- /AS1H = Absolute encoder (HIPERFACE®, multi-turn)
- /ES1H = Absolute encoder (HIPERFACE®, single-turn)
- /AK0H = Absolute encoder (HIPERFACE®, multi-turn)
- /AK1H = Absolute encoder (HIPERFACE®, multi-turn)
- /EK1H = Absolute encoder (HIPERFACE®, single-turn)
- /RH1X = special resolver
- /RH5X = special resolver

Motor protection / temperature detection
- /TF = Temperature sensor (PTC resistor)
- /TH = Thermostat (bimetallic switch)
- /KY[1)] = KTY84-130 sensor

Brake
- /BP = CMS50S/M, 24 V holding brake
- /BP = CMSB63S/M, 24 V holding brake
- /BS = CMS71L, 24 V holding brake
- /BP = CMSB71S/M/L, 24 V holding brake

Size
- 50 S/M
- 63 S/M
- 71 S/M/L

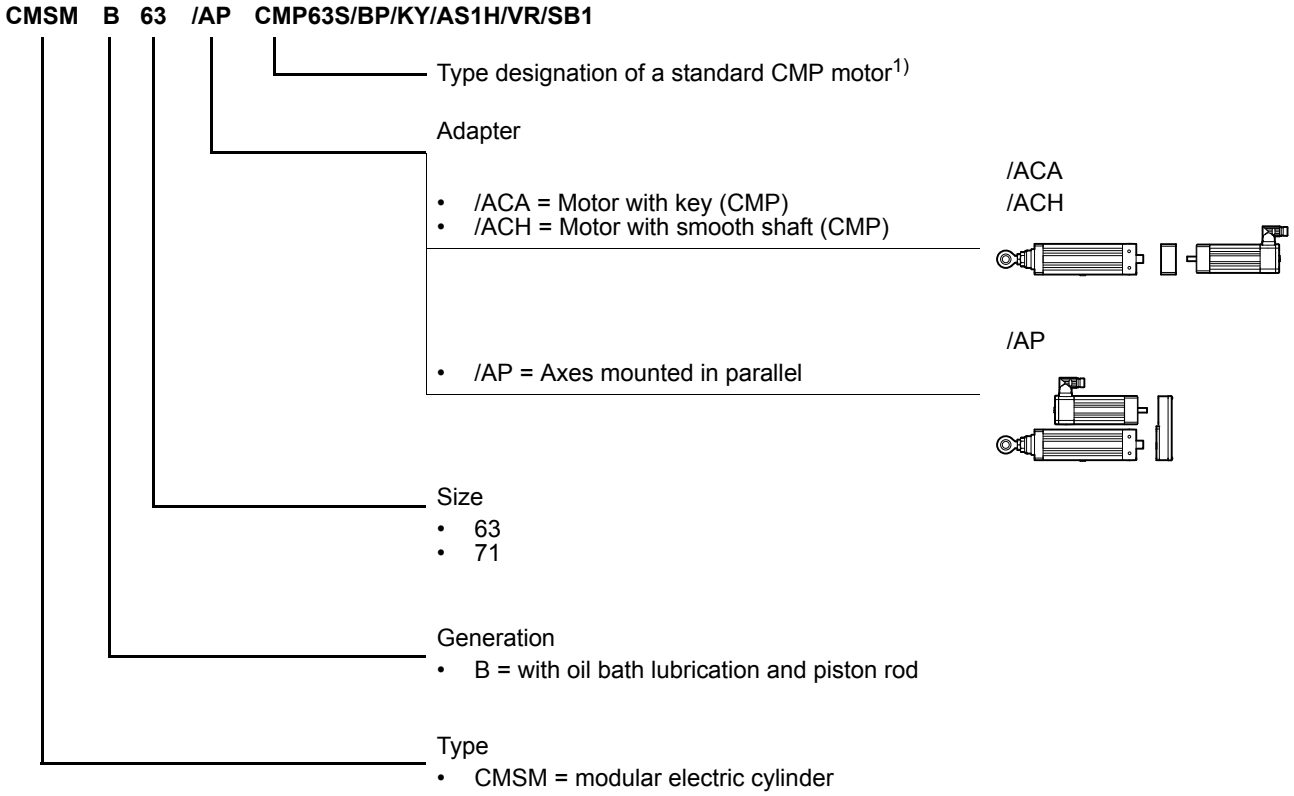
Generation
- B = CMSB63 with oil bath lubrication and piston rod
- B = CMSB71 with oil bath lubrication and piston rod
- A[2)] = CMS50 with grease lubrication and piston rod
- A[2)] = CMS71 with grease lubrication (hollow shaft design)

Type
- CMS = Electric cylinder

1) CMS50, CMSB63 and CMSB71 are only available with KTY

2) A, no designation; e.g. "CMS50S/BP (with grease lubrication)"

The following diagram shows a type designation of a modular electric cylinder:



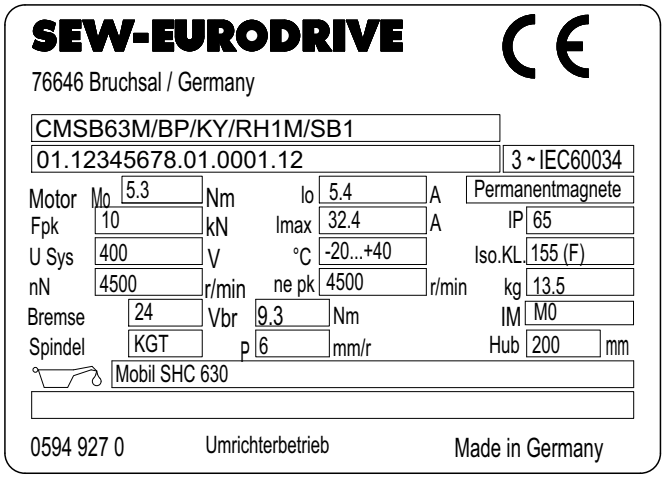
INFORMATION

1) Motor options CMPZ "heavy rotor" and BY brake are not permitted.

3.5 Nameplate

Each electric cylinder has a nameplate that provides important information. The following figure shows an example of a nameplate.

3.5.1 Example


SEW-EURODRIVE
76646 Bruchsal / Germany
CMSB63M/BP/KY/RH1M/SB1
01.12345678.01.0001.12
3 ~ IEC60034
Motor M0 5.3 Nm Io 5.4 A Permanentmagnete
Fpk 10 kN Imax 32.4 A IP 65
U Sys 400 V °C -20...+40 Iso.KL. 155 (F)
nN 4500 r/min ne pk 4500 r/min kg 13.5
Bremse 24 Vbr 9.3 Nm IM M0
Spindel KGT P 6 mm/r Hub 200 mm
Mobil SHC 630
0594 927 0
Umrichterbetrieb
Made in Germany

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Type	Motor type
No.	Manufacturing number
M_o	Standstill torque (thermal continuous torque at a speed of 5 to 50 rpm)
I_0	Standstill current
Fpk	Peak feed force
I_{max}	Maximum permitted motor current
IP	Degree of protection
U Sys	Motor voltage
°C	Ambient temperature range
Insul. cl.	Thermal class
nN	Rated speed
ne pk	Maximum mechanically permitted speed
kg	Weight
Brake	Nominal voltage of the brake/braking torque
Spindle	Spindle type
P	Spindle pitch
Stroke	Stroke length
IM	Mounting position
	Lubricant

3.6 Scope of delivery

3.6.1 CMS50

- Electric cylinder with smooth piston rod
- 4 fit bolts enclosed
- Plug connector
- Various optional connecting parts (fixed mount-on components, pivot bearings)

3.6.2 CMSB63/71

- Electric cylinder with smooth piston rod
- Plug connector, retaining screws and bolts
- Various optional connecting parts (fixed mount-on components, pivot bearings)

3.6.3 CMSMB63/71

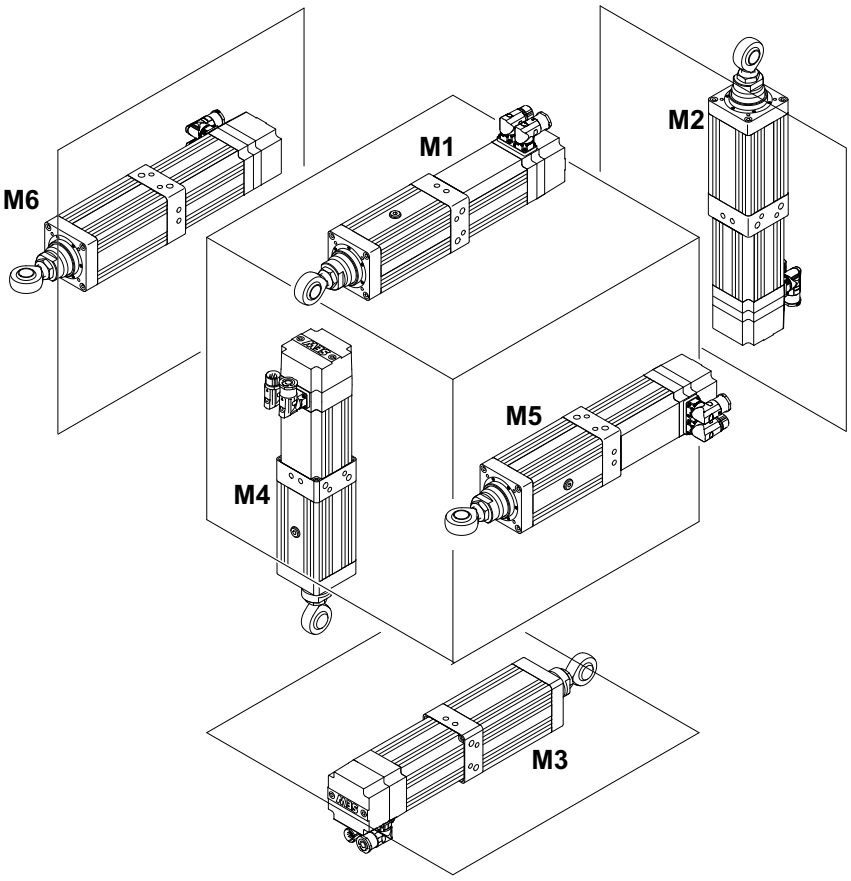
- Electric cylinder with smooth piston rod
- Plug connector, retaining screws and bolts
- Various optional connecting parts (fixed mount-on components, pivot bearings)
- Adapter flange for /ACA, /ACH design
- Toothed belt gear unit for /AP design

3.6.4 CMS71

- Electric cylinder with assembled threaded spindle and bellows
- Mechanical connecting parts with plain bearing bush (rod end bearing, optional cardan joint)
- Fixed lubrication connection option (optional preassembled lubrication device)
- Plug connector

3.7 Mounting Positions

All mounting positions are possible with all electric cylinders (M0) Observe chapter "Installation situation and stroke range" (page 27).



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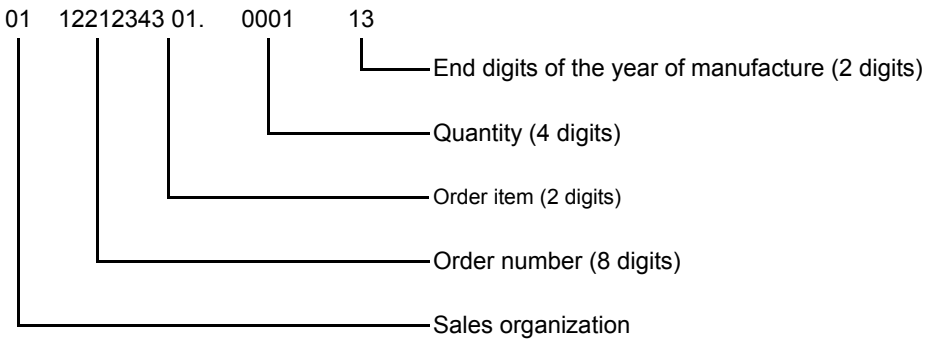
3.8 Serial number

The following information can be read from the serial number of the electric cylinder:


01 12212343 01. 0001 13
End digits of the year of manufacture (2 digits)
Quantity (4 digits)
Order item (2 digits)
Order number (8 digits)
Sales organization

3.9 Standards

3.9.1 Conformity with directives

The electric cylinders from SEW-EURODRIVE conform to the relevant standards and regulations, in particular to:

- EC directive 2006/95/EC ("low voltage directive")
- EC directive 2006/42/EC ("Machinery Directive")
- EMC Directive 2004/108/EC
- CSA C22.2 No.100-04
- UL 1004

3.10 Storage conditions

Electric cylinders are treated with an anti-corrosion agent as standard.

The motor parts are protected against corrosion for two years when stored in unopened original packaging (with Vario lubrication system one year → battery life).

Observe the following storage conditions for CMS electric cylinders:

- Store CMS electric cylinders indoors
- Keep the storage location clean and dry
- The storage temperature should be between -10 °C and +70 °C
- The humidity must not exceed 95 %
- Original packaging must not be damaged

3.11 Operating temperatures

The electric cylinders are designed for use in a temperature range between -20 °C and +40 °C.

CMS71 with BS brake must only be used in a temperature range of -5°C to 40°C.

CMSB63/71 and CMSMB63/71: If you use the electric cylinder with the piston rod pointing downwards, observe chapter "Installation situation and stroke range" (page 26)

Contact SEW-EURODRIVE if the motors are operated outside this temperature range!

4 Mechanical Installation

4.1 Before you start

Install the electric cylinder only if the following conditions are met:

- The electric cylinder must be undamaged (no damage caused by shipping or storage).
- The specifications on the nameplate of the electric cylinder correspond to the supply system or the output voltage of the servo inverter.
- The ambient temperature is between -20 °C and +40 °C.
- The installation altitude must be no higher than 1000 m above sea level, otherwise the drive must be designed to meet the special environmental conditions.
- The surrounding area is free from oils, acids, gases, vapors, radiation, etc.

4.2 Required tools/resources

- Standard tools

4.3 Installing the electric cylinder

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the electric cylinder before you start working on the unit.
- Safeguard the electric cylinder against unintentional restart.

⚠ CAUTION

The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.

⚠ WARNING

With hoist applications, make sure that the holding torque of the brake is twice as big as the corresponding load torque of the application.

Severe or fatal injuries.

- Observe the project planning guidelines.
- The spindles that are used are not self-locking.
- See chapter "Possible maximum holding forces" (page 107).

NOTICE

Improper mounting may result in damages to the electric cylinder.

Possible damage to property.

- Observe the following notes.

- Mount the electric cylinder only on a level, vibration-free and torsionally rigid support structure.
- Make sure the customer's counter-bearing is unobstructed and can move freely.
- Carefully align the electric cylinder and the driven machine to avoid placing any unacceptable strain on the spindle (observe permissible axial load data). Observe the notes in chapter 5.
- Make sure that the electric cylinder is not subject to overhung loads and bending moments.
- Do not jolt or hammer the spindle end.
- Protect the bellows, the threaded spindle and the piston rod against mechanical damage.
- Mount the electric cylinder in the specified mounting position only.
- Make sure that the warm exhaust air of other devices is not sucked in.

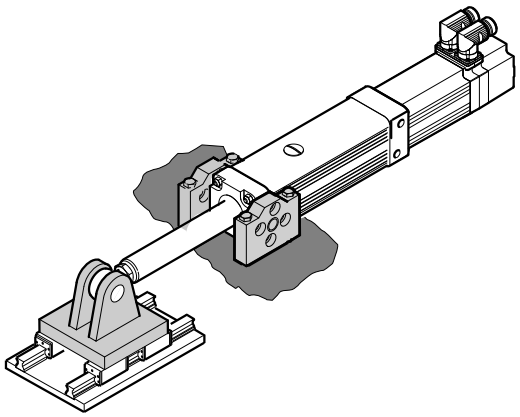
4.3.1 Installation in damp locations or outdoors

- Try to arrange the motor and encoder connection so that the connector cables do not point upwards.
- Clean the sealing surfaces of the connector (motor or encoder connection) before re-assembly.
- Replace any brittle seals.
- If necessary, restore the anticorrosive paint coat.
- Check that the degree of protection is maintained.
- Attach covers (protection canopy) for installation in the open.

4.4 Installation situation at the customer

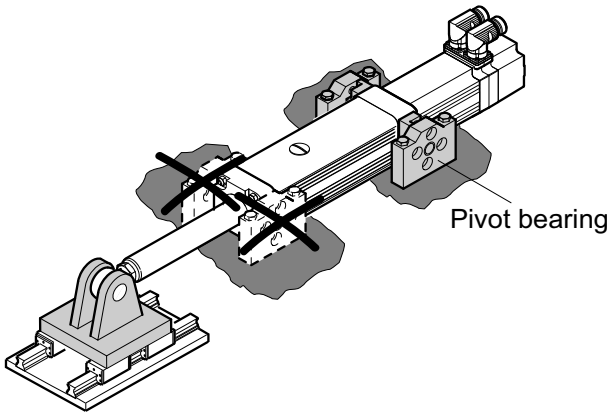
4.4.1 Installation notes CMS50, CMSB63/71, CMSMB63/71 (/ACH /ACA /AP)

- Attachment only on the output end of the piston rod is permitted only for the CMS types:
  - CMS50 stroke 70 mm with/without brake.



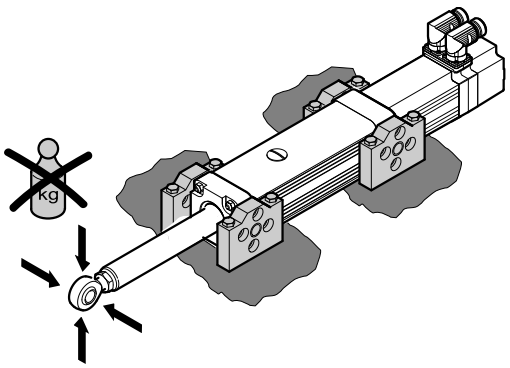
4139340171

- No statically redundant bearing. When using a pivot bearing, do not use additional attachments. (only CMS50)



4139242251

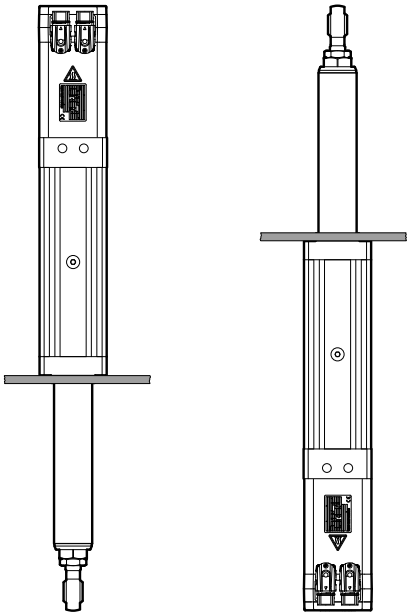
- No overhung loads on the drive



4139249931

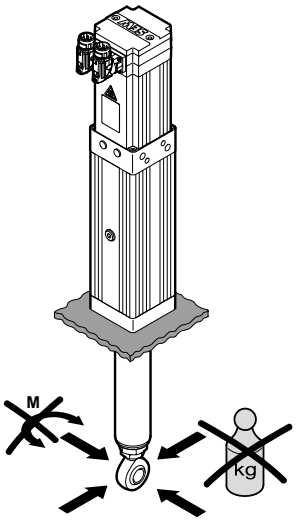
Attachment on the output end of the piston rod

- Attachment only on the output end of the piston rod is only permitted in vertical installation (max. ± 5° from the ideal vertical) with the piston rod pointing downwards or upwards.



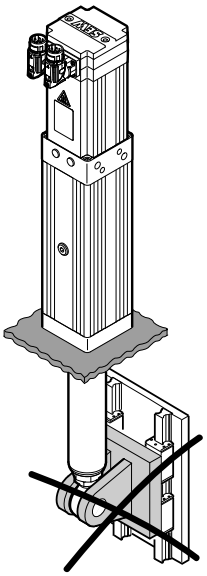
7413862923

- No overhung loads and torques on the piston rod



7413864843

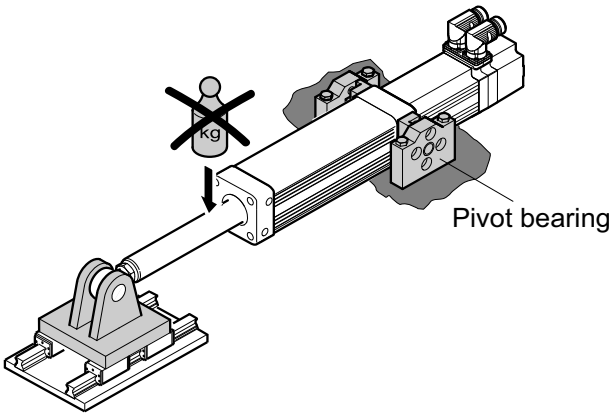
- No additional guides of the piston rod



7413866763

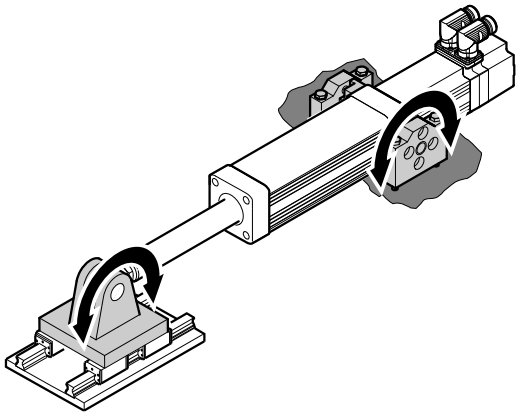
Attachment via pivot bearing

- No overhung loads on the drive



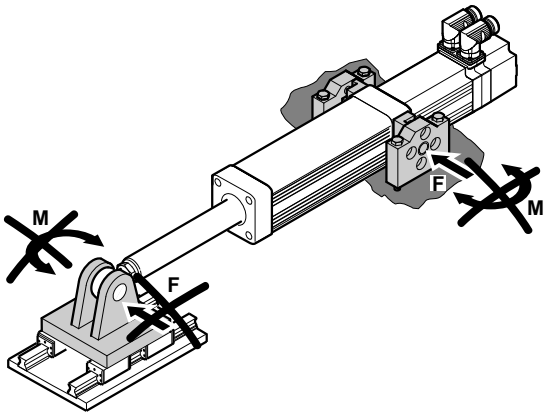
7413874443

- Joint must be free to move; do not clamp in place.



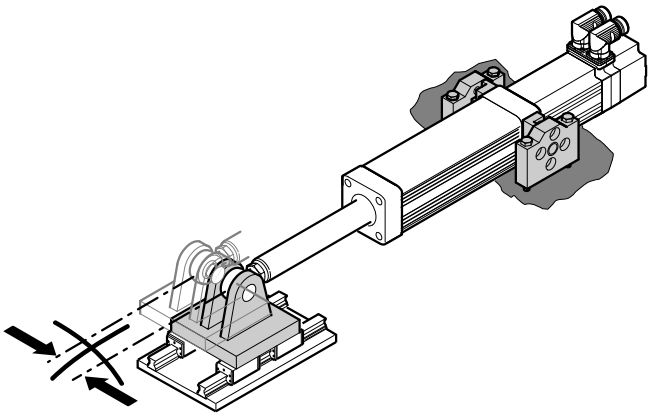
7413868683

- Do not induce loads and torques via joints



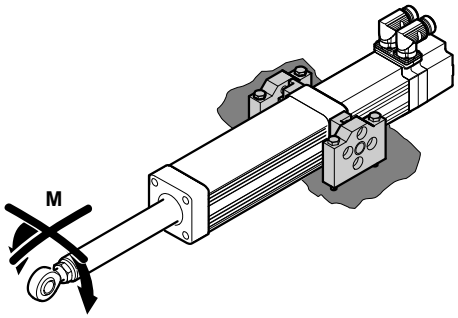
7413876363

- Do not offset the installed components.



7413870603

- Do not induce torque loads over the piston rod.

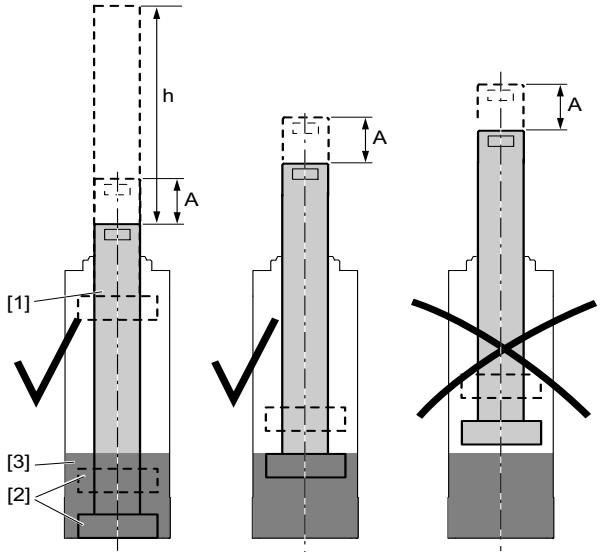


7413872523

4.4.2 Installation situation and stroke range for CMSB63/71, CMSMB63/71

Installation with piston rod pointing upwards

When mounting the electric cylinder, note that the spindle nut is not lubricated in case of incorrect stroke setting. With short working strokes [A], the end position of the spindle nut [2] must be smaller than half the stroke length [1/2 h] of the total stroke [h] of the electric cylinder.



4139888779

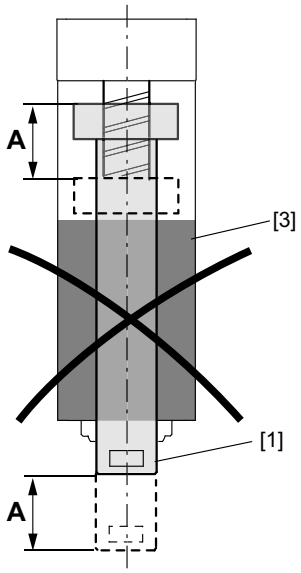
[1] Piston rod
[2] Spindle nut
[3] Oil

Installation with piston rod pointing downwards

For applications where the piston rod extends downwards, a lubricant pump is integrated to ensure lubrication.

The pumping effect of the extending and retracting piston rod is used via internal valves to ensure lubrication of the electric cylinder.

- Observe the following restrictions when installing the electric cylinder.
  - For ambient temperatures of -10 °C – 40 °C
    - n_{min} 180 rpm
    - s_{min} 50 mm
  - For ambient temperatures of -20°C – 40 °C
    - n_{min} 500 rpm
    - s_{min} 50 mm
- Observe the following stroke settings when installing the electric cylinder.
  - Short, permanent working strokes [A] from retracted piston rod position [1], above medium stroke position (above the oil level) [3]), are not permitted.

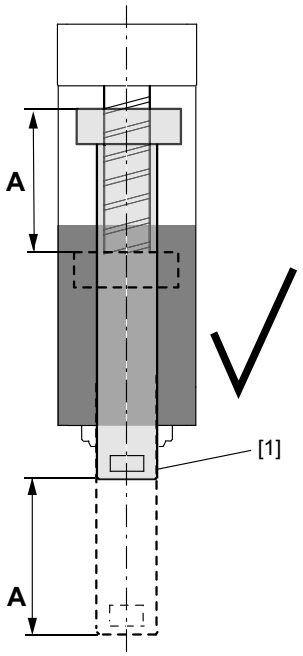


4139374731

INFORMATION

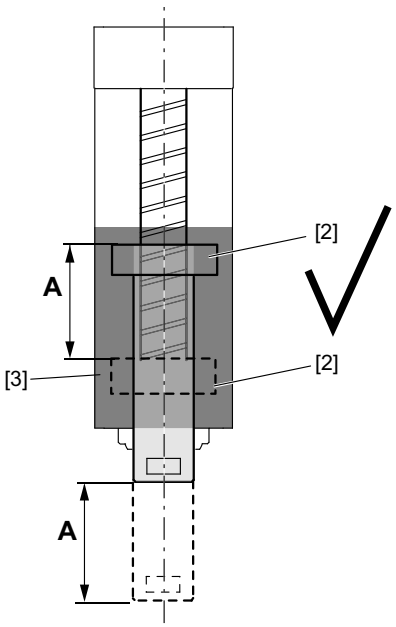
- For applications with the working stroke above the oil level, please contact SEW-EURODRIVE.
- Please note the following restrictions. They have general character In addition, the lubrication system provides a broader spectrum that must be checked for individual customer applications. Consult SEW-EURODRIVE.

– Working strokes [A] from retracted piston rod position [1] must be extended at least up to half the stroke length +25 mm.



4139376651

– Working strokes [A] below the medium stroke position of the nominal stroke are permitted if the spindle nut [2] is completely immersed in the oil [3]. The working stroke "A" must be at least 8 mm.



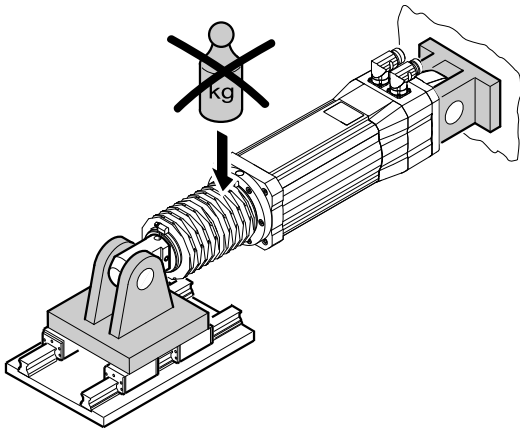
4139944843

INFORMATION

This mounting position is especially suited for small strokes at high frequencies.

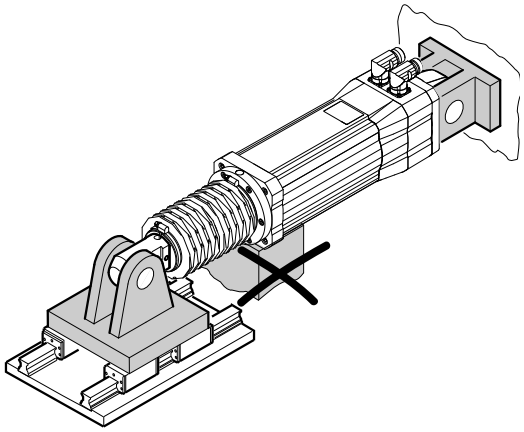
4.4.3 Installation notes CMS71

- No overhung loads on the drive



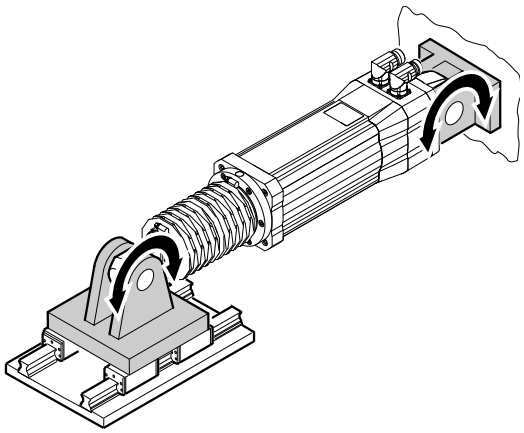
4139226891

- No additional fastenings or supports (statically redundant)



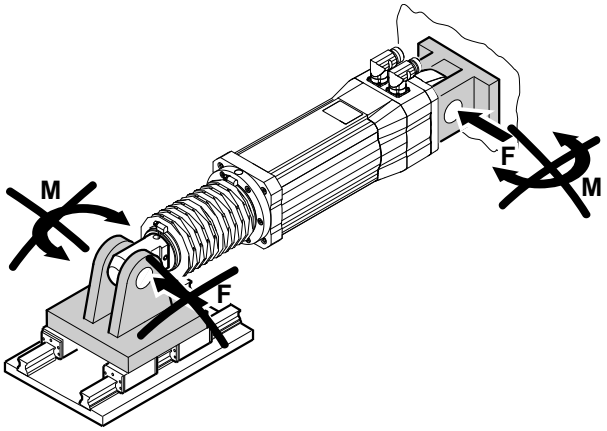
4139228811

- Joints must be free to move; do not clamp in place.



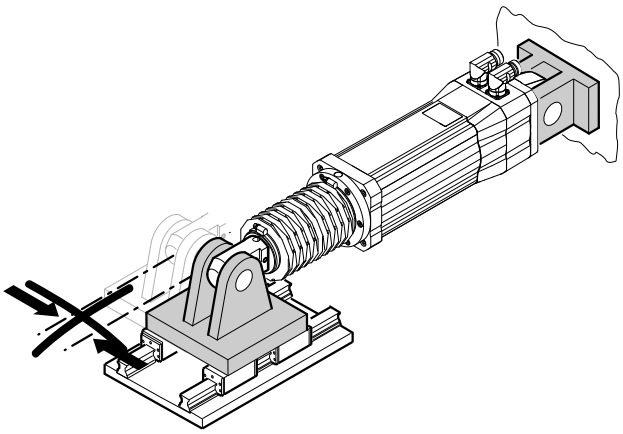
4139230731

- Do not induce loads and torques via joints.



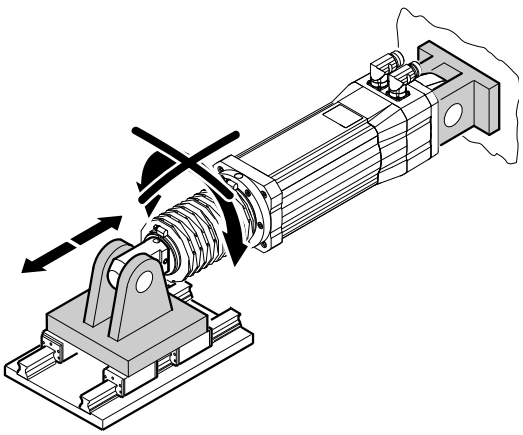
4139232651

- Do not offset from the mounting position see installation tolerances (page 33)



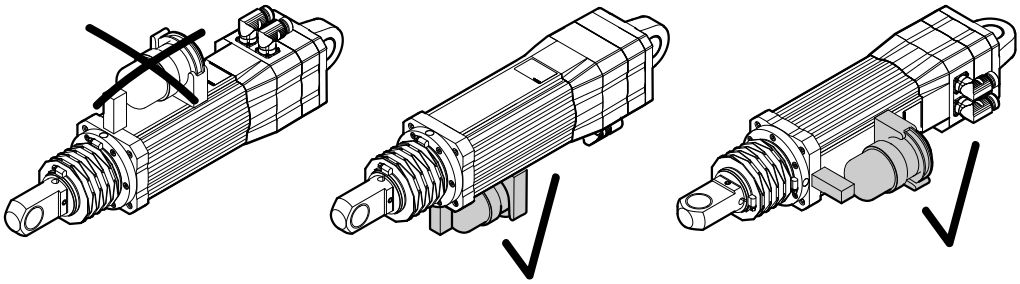
4139234571

- Install so that the unit is not subject to torque (torsion).



4139236491

- For **horizontal** mounting position with lubricator option: position lubricator on the side or bottom. If this mounting situation cannot be avoided, contact SEW-EURODRIVE.



4139251851

INFORMATION

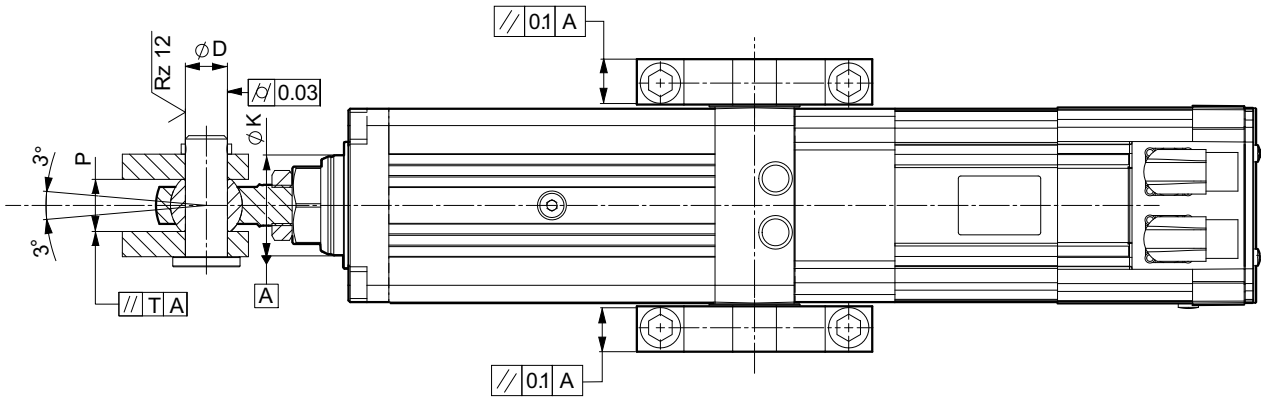
For the external installation of the lubricator (not directly on the motor) consult SEW-EURODRIVE

INFORMATION

In case of high thermal loads, dissipated heat can affect the lubricant properties.

4.4.4 Tolerances for mounting by the customer CMS50, CMSB63/71, CMSMB63/71

The following figure describes the mounting situation for both mounting sides of the drive.



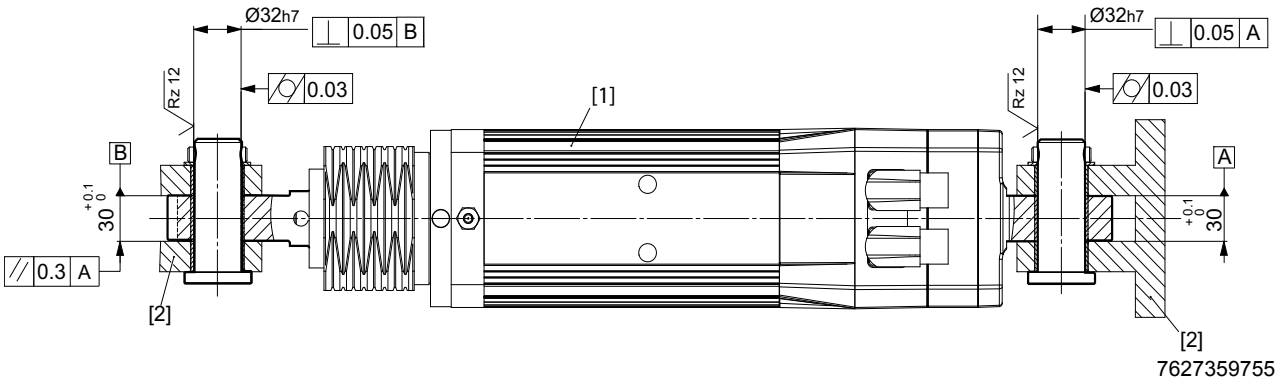
7625893899

Type	K	D	P	T
CMS50	Ø 32	Ø 16 h7	21 +0.1	0.1 for stroke 70 – 300
CMSB63 **CMSMB36**	Ø 50	Ø 20 h7	25 +0.1	0.1 for stroke 100 – 200
				0.2 for stroke 400 – 600
CMSB71 **CMSMB71**	Ø 60	Ø 25 h7	31 +0.1	0.1 for stroke 100 – 200
				0.2 for stroke 400 – 600
				0.3 for stroke 800 – 1200

4.4.5 Tolerances of the installation tolerances by the customer for CMS71

The following figure describes the mounting situation for both mounting sides of the drive.

Standard



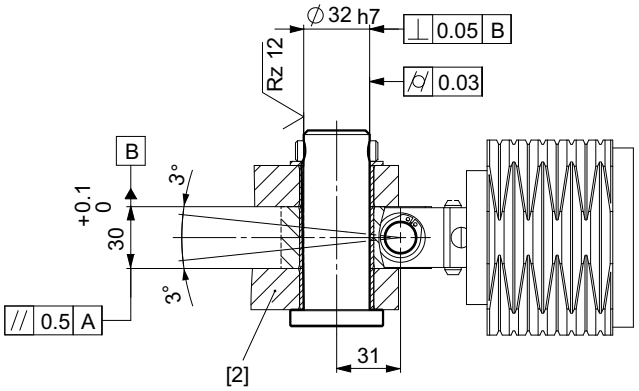
[1] CMS electric cylinders
[2] Customer-supplied parts

Please observe the following information:

INFORMATION

- The max. axial offset between A-B is 0.15 mm
- The parts supplied by the customer must meet the requirements described above.
- If mounting tolerances cannot be complied with, contact SEW-EURODRIVE. An electric cylinder with a cardan joint might fit the mounting situation.

Cardan joint



7627361675

Please observe the following information:

INFORMATION

The max. axial offset between A-B is 0.5 mm

4.5 Mechanical stroke limiting

INFORMATION

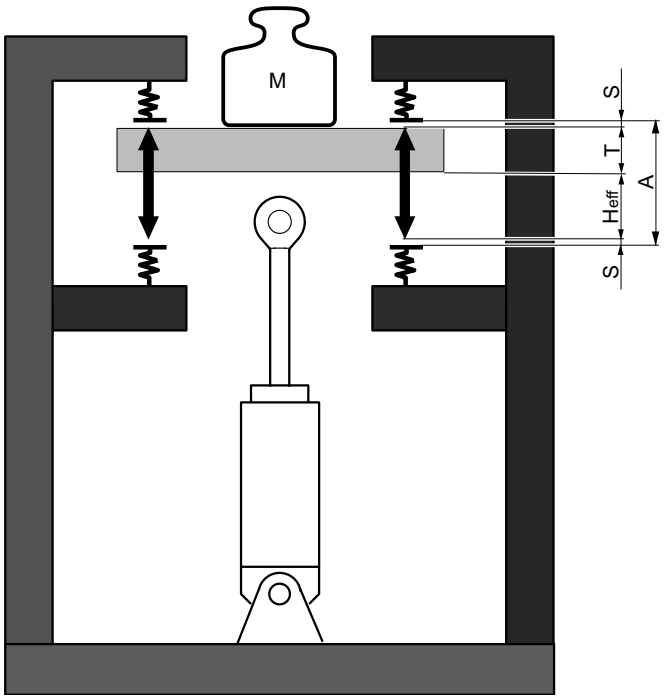
The customer must limit the stroke of the electric cylinder by providing for appropriate measures in the extended and retracted position, e.g. by using limit stops, cushioning or shock absorbers.

The mechanical limiting elements built-in by the customer must be able to absorb the reactive forces and kinetic energy that is created when the end position stops are reached in order to prevent the maximum permitted feed thrust of the electric cylinder from being exceeded. This requires soft, damping elements. Their purpose is to absorb the energy and then limit the end position mechanically. As a rule, you should use cushioning or shock absorbers that are dimensioned accordingly.

4.5.1 Mechanical stroke limiting

INFORMATION

The rated stroke length (H_{CMS}), e.g. CMS71L stroke 200 mm, is only available in limited form for the customer application because safety distances (S) to the limit stops restrict the effective stroke (H_{eff}).



[H_{eff}]	Effective stroke	[A]	Distance between limit stops
[H_{CMS}]	Nominal stroke CMS	[T]	Partial width
[S]	Safety distance	[M]	Mass

Calculating the effective stroke

The effective stroke can be calculated as follows:

$H_{eff} = A - T - 2 \times S$

or

$H_{eff} = H_{CMS} - 2 \times S$

$\rightarrow H_{eff} < H_{CMS}$

4.6 VR forced cooling fan

The electric cylinders CMS50, CMSB63/71, CMSMB63/71 can be equipped with an optional VR forced cooling fan.

INFORMATION

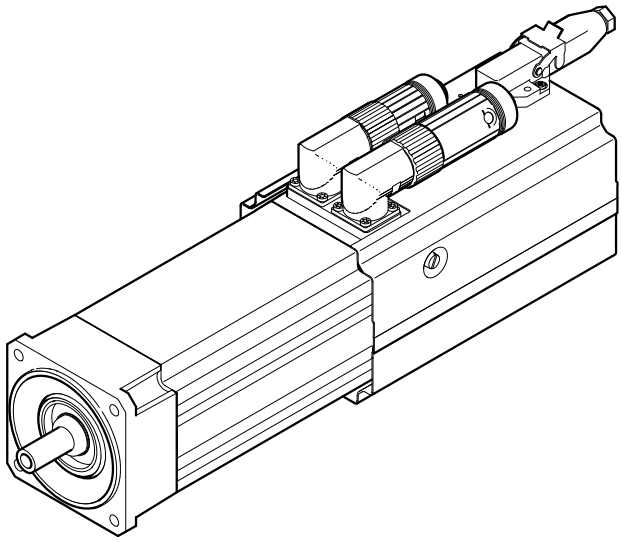
The forced cooling fan can only be used up to a maximum oscillation and shock load of 1 g.

4.6.1 Mechanical installation

Mounting the fan guard for the VR forced cooling fan:

Motor	Screws	Tightening torque
CMS50, CMSB63, CMSMB63	M4 × 8 self-tapping	4 Nm
CMSB71, CMSMB71	M6 × 20	4 Nm [1)]

1) Additional Loctite® thread lock fluid



4.6.2 Retrofit set for CMS50, CMSB63/71, CMSMB63/71

Forced cooling fan retrofit sets are available for the motors of CMS50, CMSB63/71, CMSMB63/71.

INFORMATION

The forced cooling fan retrofit set may only be mounted by staff authorized by SEW-EURODRIVE.

For information on the retrofit set, refer to the "Synchronous Servomotors" catalog.

5 Electrical Installation

⚠ WARNING

Danger of electric shock.

Severe or fatal injuries.

- Observe the following notes.

- It is essential to comply with the safety notes in chapter 2 during installation!
- Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the electric cylinder and the brake.
- Use switch contacts in utilization category DC-3 according to EN 60947-4-1 for switching the brake with DC 24 V.
- When electric cylinders are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer.
- Observe the operating instructions of the inverter.

NOTICE

Use switch contacts in utilization category AC-3 to EN 60947-4-1 for connecting the electric cylinder and brake.

Use switch contacts in utilization category DC-3 to EN 60947-4-1 for connecting the brake to DC 24 V.

INFORMATION

- A bag containing the following information is attached to the electric cylinder:
  - Safety notes
  - Wiring diagram

  Observe these notes.

5.1 Additional regulations

The generally applicable installation regulations for low-voltage electric equipment (such as DIN IEC 60364, DIN EN 50110) must be complied with when setting up electrical machinery.

5.2 Compulsory use of the wiring diagrams

The electric cylinder is connected according to the wiring diagram(s) available from SEW-EURODRIVE free of charge.

Do not connect or start up the electric cylinder if the wiring diagram is missing.

5.3 Wiring information

5.3.1 Protecting the brake control system against interference

To protect the brake control system against interference, do not route unshielded brake cables together with switched-mode power cables.

Switched-mode power cables include in particular:

- Output cables from servo inverters, converters, soft start units and brake units
- Supply cables for braking resistors and similar options

5.3.2 Thermal motor protection

NOTICE

Electromagnetic interference of the drives.

Possible damage to property.

- Install the connecting lead of the KTY separately from other power cables maintaining a distance of at least 200 mm. The cables can only be routed together if either the KTY cable or the power cable is shielded.

5.4 Connection of power and signal cables via the connector system

The cable entry of the power and signal cable is installed using an adjustable right-angle connector. Once the mating connector has been plugged in, the right-angle connector can be adjusted as required without using additional tools. A torque of > 8 Nm is required to adjust the connector.

NOTICE

Damage of the right-angle connector in case of rotation without mating connector.

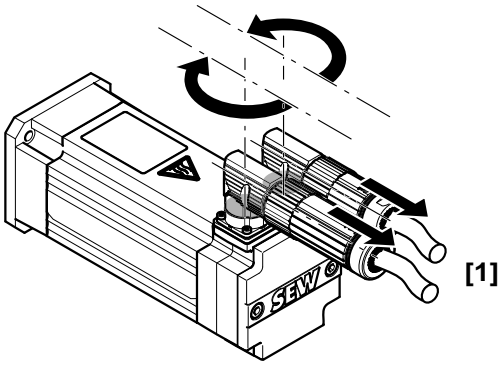
Possible damage to property.

- Do not use pliers to adjust the right-angle connector before connecting it. This might damage the thread and the sealing surface.

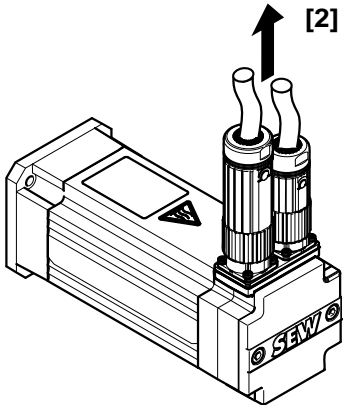
5.4.1 Connector positions

An adjustable position has been defined for right-angle, adjustable connectors [1]. This is the standard connector position. It corresponds to connector position "3".

A "radial" position has been defined for the straight plug connectors (radial output). Radial connectors [2] are optional.



[1] "Adjustable" connector position



[2] "Radial" connector position

INFORMATION

- Comply with the permitted bending radii of the cables.
- When using low-capacity trailing cables, the bending radii are larger than for the previously used standard cables.
- SEW-EURODRIVE recommends the use of low-capacity cables.

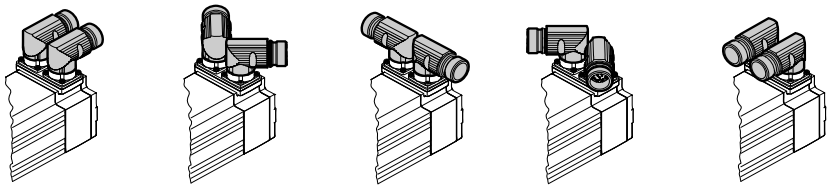
The right-angle plug connectors can be rotated to achieve the required position.

INFORMATION

The connector should only be rotated to install and connect the motor.

Do not turn the plug connector regularly once it has been installed.

Positions of the adjustable connectors (examples)



5.5 Connecting the motor and the encoder system via plug connector SM. / SB.

Electric cylinders are supplied with the SM.. / SB. plug connector system.

In the basic version, SEW-EURODRIVE delivers electric cylinders with right-angle connector on the motor end and without mating connector. The encoder system is connected using a separate 12-pin round plug connector.

The mating connectors can be ordered separately or together with the motor.

NOTICE

Potential damage to the right-angle connector.

Possible damage to property.

- Do not align the right-angle connector frequently.

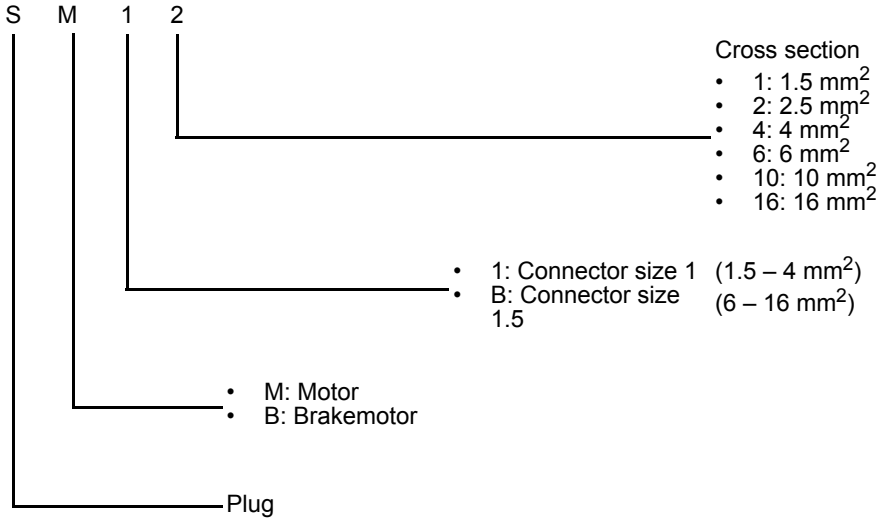
All electric motors are equipped with quick-lock right-angle connectors (SpeedTec). If you use connectors without quick lock, the O-ring serves as vibration protector. The connector can only be screwed on until it reaches the O-ring. The connector is always sealed at the bottom.

If you use self-assembled cables with quick lock, you must remove the O-ring.

5.5.1 Plug connector on the cable end

Unit designation of the plug connectors

The following diagram shows a type designation:


S M 1 2
Cross section
• 1: 1.5 mm²
• 2: 2.5 mm²
• 4: 4 mm²
• 6: 6 mm²
• 10: 10 mm²
• 16: 16 mm²
• 1: Connector size 1 (1.5 – 4 mm²)
• B: Connector size 1.5 (6 – 16 mm²)
• M: Motor
• B: Brakemotor
Plug

Power cable and plug connector CMP motors/electric cylinders CMS..50 – 71

Cable type		Connector type	Thread size	Cable cross section	Part number	
					Prefabricated cables	Spare power plug*
Fixed installation	Motor cable	SM11	M23	4 x 1.5 mm²	0590 4544	0198 6740
		SM12		4 x 2.5 mm²	0590 4552	0198 6740
		SM14		4 x 4 mm²	0590 4560	0199 1639
	Brakemotor cable[1] BP brake	SB11	M23	4 x 1.5 mm² + +2 x 1 mm²	1335 4345	0198 6740
		SB12		4 x 2.5 mm² + +2 x 1 mm²	1335 4353	0198 6740
		SB14		4 x 4 mm² + +2 x 1 mm²	1335 4361	0199 1639
Cable carrier installation	Motor cable	SM11	M23	4 x 1.5 mm²	0590 6245	0198 6740
		SM12		4 x 2.5 mm²	0590 6253	0198 9197
		SM14		4 x 4 mm²	0590 4803	0199 1639
	Brakemotor cable[1] BP brake	SB11	M23	4 x 1.5 mm² + +2 x 1 mm²	1335 4388	0198 9197
		SB12		4 x 2.5 mm² + +2 x 1 mm²	1335 4396	0198 9197
		SB14		4 x 4 mm² + +2 x 1 mm²	1342 1603	0199 1639

1) BP brake: 3-core cable, only 2 cores are used

* The complete connector service pack always includes the following parts:

- Power connector,
- Insulation inserts,
- Socket contacts.

Extension cables for power cables are listed in the "Synchronous Servomotors" catalog or the "Electric cylinder CMS".

Replaced brakemotor cables

The brake cores of the replaced brakemotor cables are labeled differently from today's standard. This applies to the following cables:

Cable type		Connector type	Cable cross section	Part number	
				Prefabricated cables	Spare power connector*
Fixed installation	Brakemotor cable[1] BP brake	SB11	4 x 1.5 mm^2 + +2 x 1 mm^2	1332 4853	1335 4345
		SB12	4 x 2.5 mm^2 + +2 x 1 mm^2	1333 2139	1335 4353
		SB14	4 x 4 mm^2 + +2 x 1 mm^2	1333 2147	1335 4361
Cable carrier installation	Brakemotor cable[1] BP brake	SB11	4 x 1.5 mm^2 + +2 x 1 mm^2	1333 1221	1335 4388
		SB12	4 x 2.5 mm^2 + +2 x 1 mm^2	1333 2155	1335 4396
		SB14	4 x 4 mm^2 + +2 x 1 mm^2	1333 2163	1335 1603

1) BP brake: 3-core cable, only 2 cores are used

INFORMATION

BP brake: The polarity is not relevant when connecting the BP brake, i.e. the replaced cables can still be used.

BS brake: Observe the polarity when connecting the BS brake.

Dependence of mating connector on cable diameter and crimping area

SM1/SB1 connector type	Crimping area U, V, W, PE mm^2	Cable crimping diameter mm
01986740	0.35 – 2.5	9 – 14
01989197	0.35 – 2.5	14 – 17
01991639	0.5 – 4	12 – 17

The connector service packs also contain the brake pins, so that no difference needs to be made between motor and brakemotor.

5.5.2 Encoder cables

Cable type		Cable cross section	FI type	Part number	
				Prefabricated cables	Signal connector*
Fixed installation	Resolver cable	5 x 2 x 0.25 mm^2	MOVIDRIVE®	0199 4875	0198 6732
			MOVIAXIS®	1332 7429	
Cable carrier installation			MOVIDRIVE®	0199 3194	
			MOVIAXIS®	1332 7437	
Fixed installation	Hiperface® cable	6 x 2 x 0.25 mm^2	MOVIDRIVE®/ MOVIAXIS®	1332 4535	0198 6732
Cable carrier installation			MOVIDRIVE®/ MOVIAXIS®	1332 4551	

* The complete connector service pack always includes the following parts:

- Feedback connector,
- Insulation inserts,
- Socket contacts.

Extension cables for power and feedback cables are listed in the "Synchronous Servomotors" catalog.

5.5.3 Forced cooling fan cables

Cable type		Cable cross section	Part number
Fixed installation	Forced cooling fan cables	3 x 1 mm^2	0198 6341
Cable carrier installation		3 x 1 mm^2	0199 560X

Extension cables for forced cooling fan cables are listed in the "Synchronous Servomotors" catalog.

5.5.4 Prefabricated Cables

Prefabricated cables are available from SEW-EURODRIVE for connection with the SM./SB. plug connector system. For information on the prefabricated cables, refer to the "Electric Cylinder" catalog.

The plug connectors are depicted with the connector assignment on the cable at the connection side (back).

If you assemble cables yourself, observe the manual "Cable assembly".

Note the following points if you want to assemble the cables yourself:

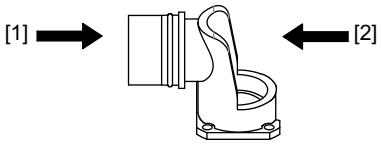
- The socket contacts for the motor connection are implemented as crimping contacts. Only use suitable tools for crimping.
- Strip the insulation off the connection leads. Apply shrink tubing to the connectors.
- Incorrectly installed socket contacts can be removed without removal tools.

5.5.5 Wiring diagrams

Symbols used

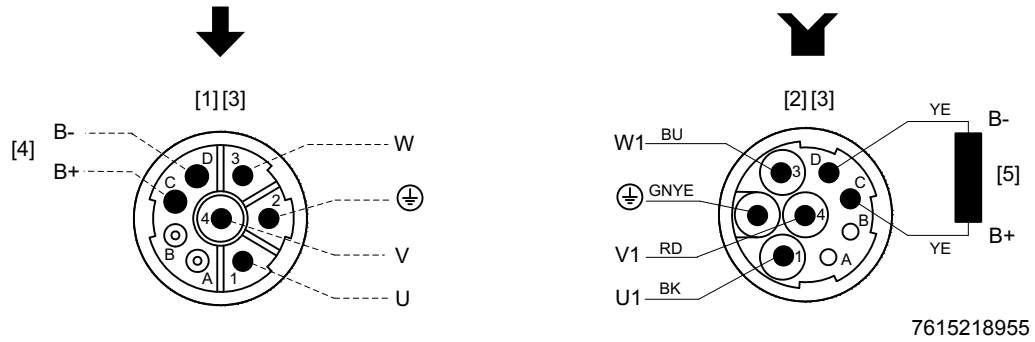
	Plug connector upper part (top view on flange socket), To be connected by the customer
	Plug connector lower part, Connected at the factory

Connection SM1 / SB1 power plug connector



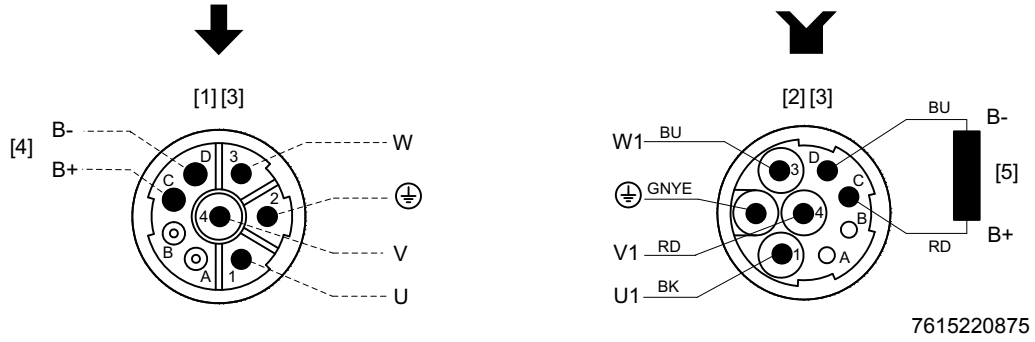
[1] Contact end
[2] Connection side

CMS50, CMSB63/71, CMSMB63/71 wiring diagram with/without BP brake



[1] Contact end
[3] Pin contacts (male)
[4] BP brake (optional)
[5] Brake coil (optional)

CMS71 wiring diagram with/without BS brake



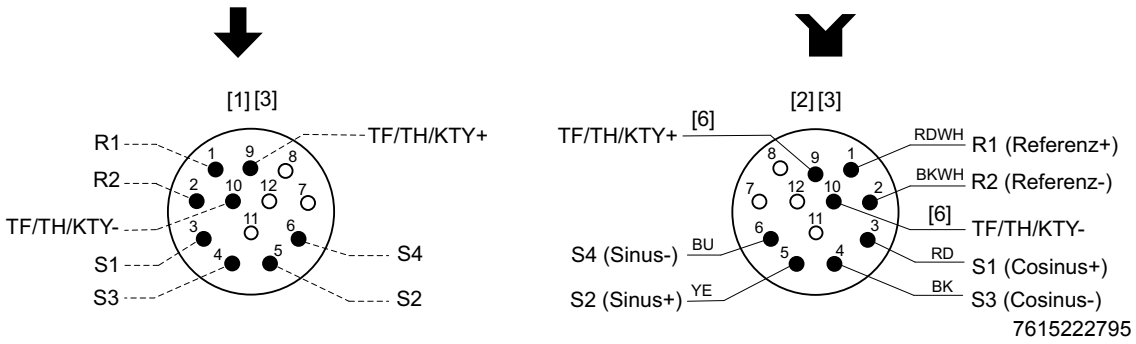
[1] Contact end
[3] Pin contacts (male)
[4] BS brake (optional)
[5] Brake coil (optional)

INFORMATION

Observe the polarity.

Wiring diagram for RH1M resolver signal plug connectors

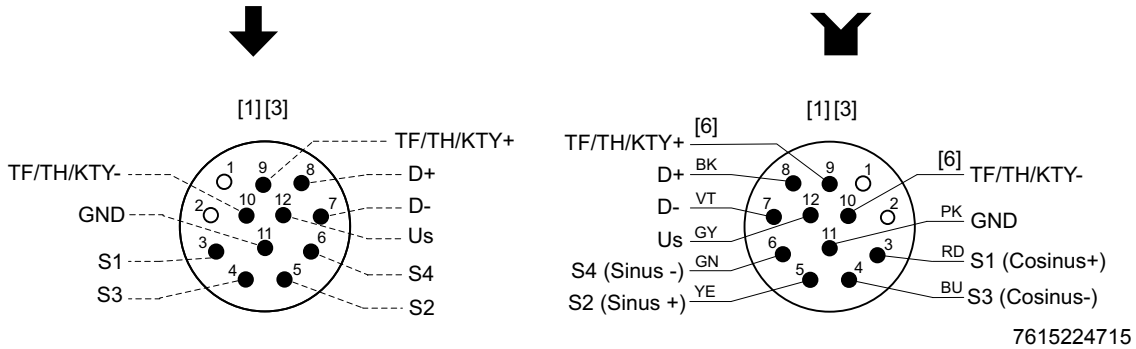
Wiring diagram



[1] Contact end
[2] Connection side
[3] Pin contacts (male)
[6] KTY+ (RD), KTY- (BU), TF (BK), TH (VT)

Signal plug connectors for ES1H, AS1H, AK0H, EK0H encoders

Wiring diagram



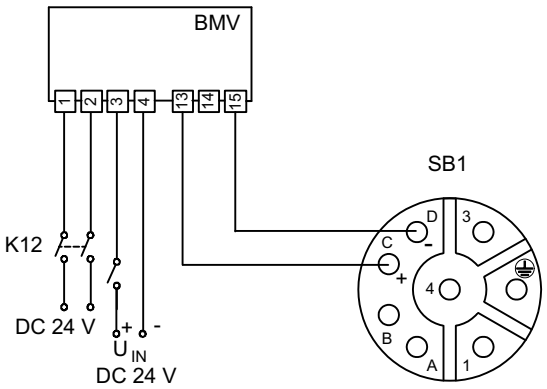
[1] Contact end
[2] Connection side
[3] Pin contacts (male)
[6] KTY+ (RD), KTY- (BU), TF (BK), TH (VT)

Wiring diagrams of the brake control – BP/BS brake

In every application, the BP/BS holding brake can be controlled via the BMV brake relay or a customer relay with varistor overvoltage protection.

If the system complies with the specifications for direct brake control, then a BP/BS brake can also be controlled directly via the brake output of a MOVIAXIS® servo inverter.

BMV brake controller



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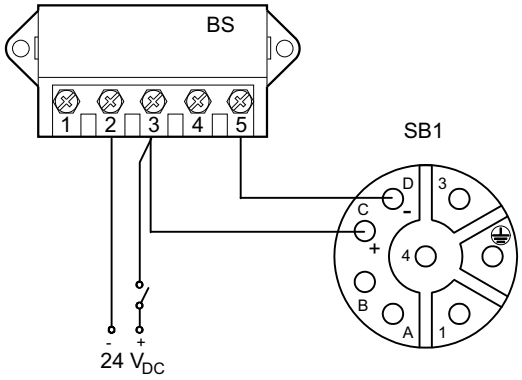
Connection 1, 2	Power supply
Connection 3, 4	Signal (inverter)

BS brake contactor



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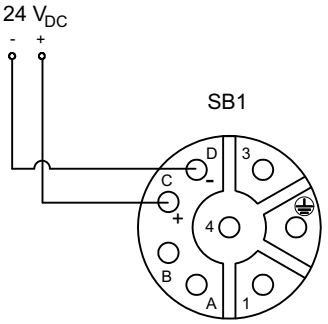
Direct 24 V brake supply



6959692427

In the following cases, the brake must be protected from overvoltages, e.g. via a varistor protection circuit:

- Operation on non-SEW inverters,
- If the brake is not directly supplied from the SEW inverter.

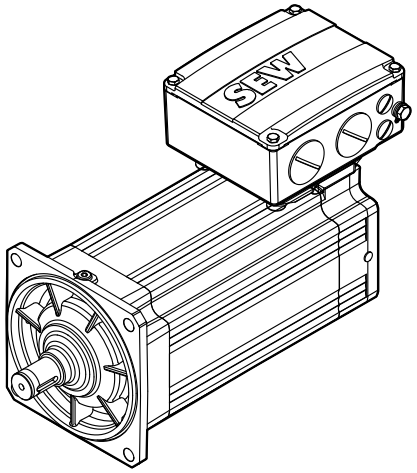
5.6 Connecting the motor and encoder system via KK/KKS terminal box

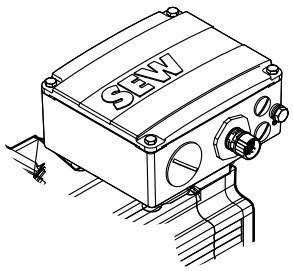
INFORMATION

The terminal box option is only available for CMSMB (modular mounting position).

- Check the cable cross sections.
- Screw on the connections and PE conductors.
- Check the winding connections in the terminal box and tighten them, if necessary.
- You have to use an EMC cable gland for the signal cable entry in order to ensure a flawless shielding.

5.6.1 Connection option via terminal box

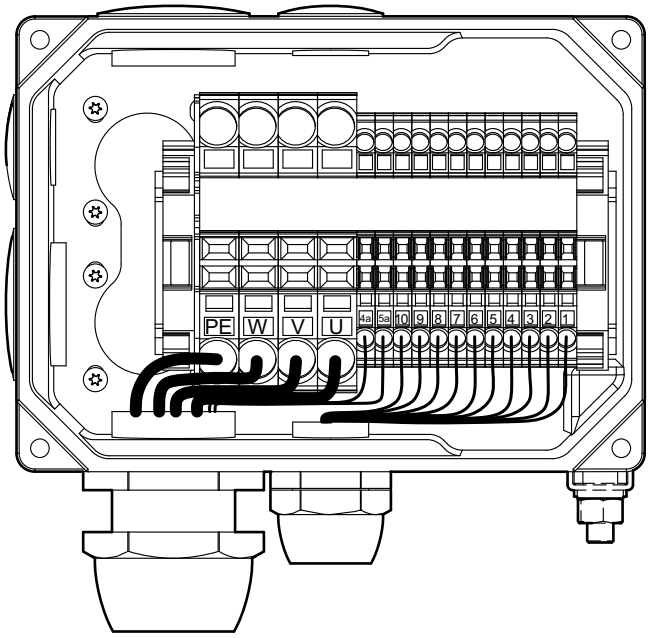




Connection cross section

Motor type	Power connection			Encoder / resolver / thermal motor protection	
	Connection	Maximum connection cross section	Cable entry	Connection	Cable entry
CMSMB63	Spring terminals	6 mm^2	M25	Spring terminals	M20
CMSMB71	M6 stud	10 mm^2	M32		M16

5.6.2 Connection CMSMB63



Power

Pin	Core identification	Connection
U	(BK/WH) Black with white lettering U, V, W	U
V		V
W		W
PE	(GN/YE) Green/Yellow	Protective earth

BP brake

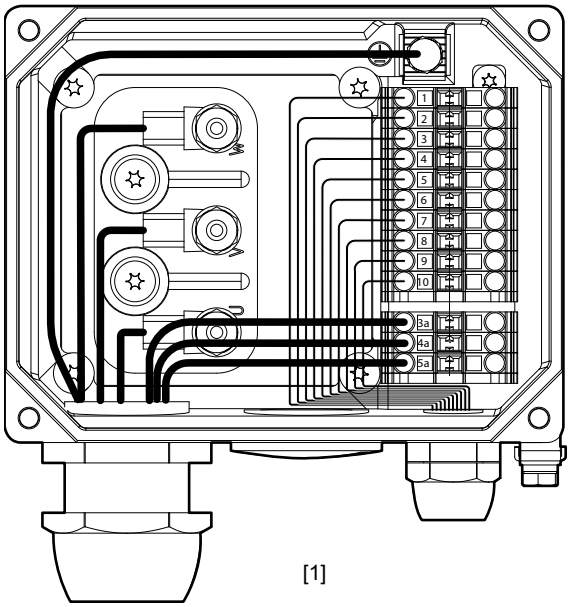
Auxiliary terminal contacts	Core identification	BMV brake rectifier connection	BS brake controller connection
4a	(BK/WH) Black with white lettering 1, 2, 3	13	3
5a		15	5

The brake has a standard supply voltage of DC 24 V.

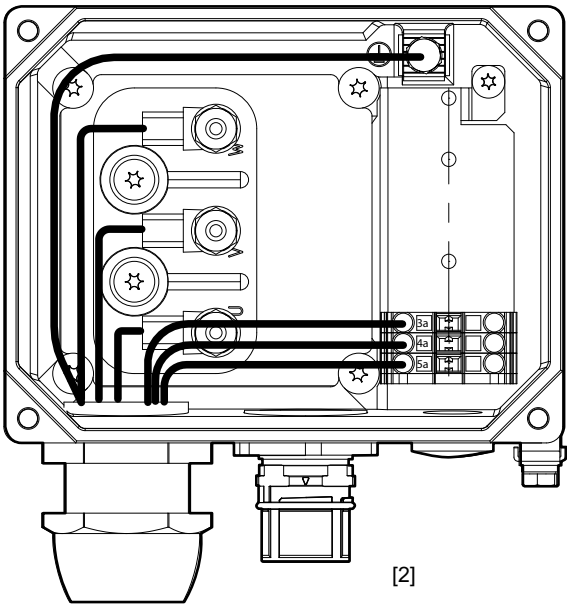
Signal

Resolver				Encoder			
1	RD/WH	ref +	Reference	1	RD	cos +	Cosine
2	BK/WH	ref -		2	BU	ref cos	Reference
3	RD	cos +	Cosine	3	YE	sin+	Sine
4	BK	cos -		4	GN	ref sin	Reference
5	YE	sin+	Sine	5	VT	D -	DATA
6	BU	sin -		6	BK	D +	DATA
7		-	-	7	PK	GND	Ground
8		-	-	8	GY	Us	Supply voltage
9	RD(BK)	KTY + / (TF)	Motor protection	9	RD(BK)	KTY + / (TF)	Motor protection
10	BU(BK)	KTY - / (TF)		10	BU(BK)	KTY - / (TF)	

5.6.3 Connection CMSMB71



[1]



[2]

[1] KK terminal box

[2] KKS terminal box

Power

Pin	Core identification	Connection
U	(BK/WH) Black with white lettering U, V, W	U
V		V
W		W
PE	(GN/YE) Green/Yellow	Protective earth

BP brake

Auxiliary terminal contacts	Core identification	BMV brake rectifier connection	BS brake controller connection
4a	(BK/WH) Black with white lettering 1, 2, 3	13	3
5a		15	5

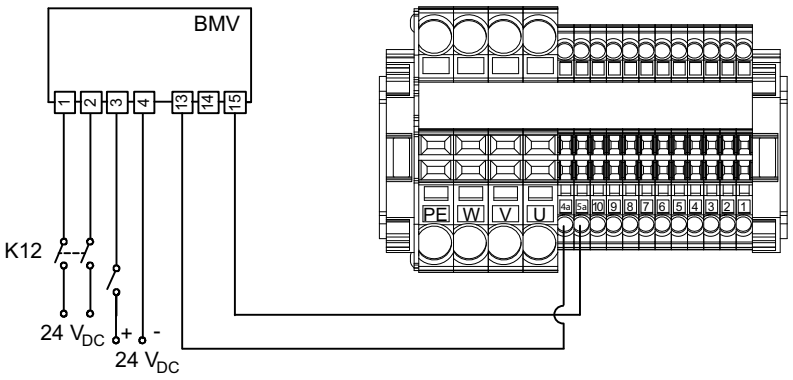
The brake has a standard supply voltage of DC 24 V.

Signal

Resolver				Encoder			
1	RD/WH	ref +	Reference	1	RD	cos +	Cosine
2	BK/WH	ref -		2	BU	ref cos	Reference
3	RD	cos +	Cosine	3	YE	sin+	Sine
4	BK	cos -		4	GN	ref sin	Reference
5	YE	sin+	Sine	5	VT	D -	DATA
6	BU	sin -		6	BK	D +	DATA
7		-	-	7	PK	GND	Ground
8		-	-	8	GY	Us	Supply voltage
9	RD(BK)	KTY + / (TF)	Motor protection	9	RD(BK)	KTY + / (TF)	Motor protection
10	BU(BK)	KTY - / (TF)		10	BU(BK)	KTY - / (TF)	

5.6.4 Wiring diagrams of the BP brake control

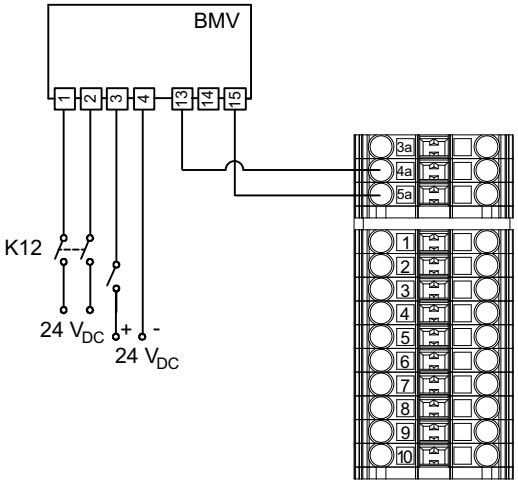
Brake control unit BMV – CMSMB63



Connection 1, 2 Power supply

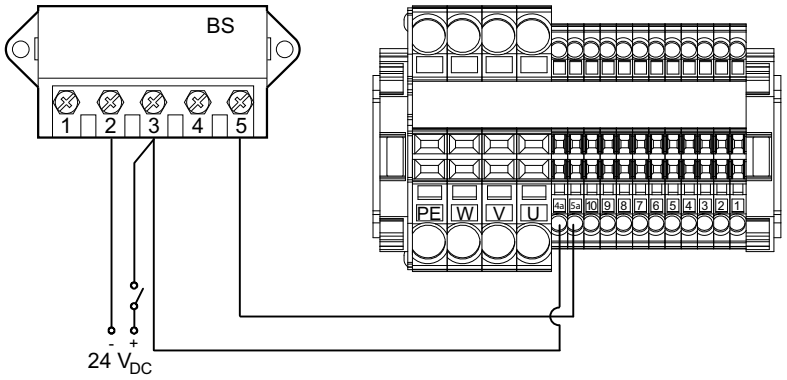
Connection 3, 4 Signal (inverter)

Brake control unit BMV – CMSMB71

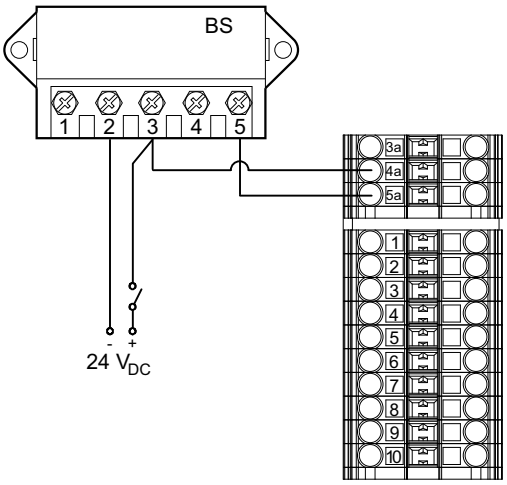


Connection 1, 2	Power supply
Connection 3, 4	Signal (inverter)

Braking contactor BS – CMSMB63

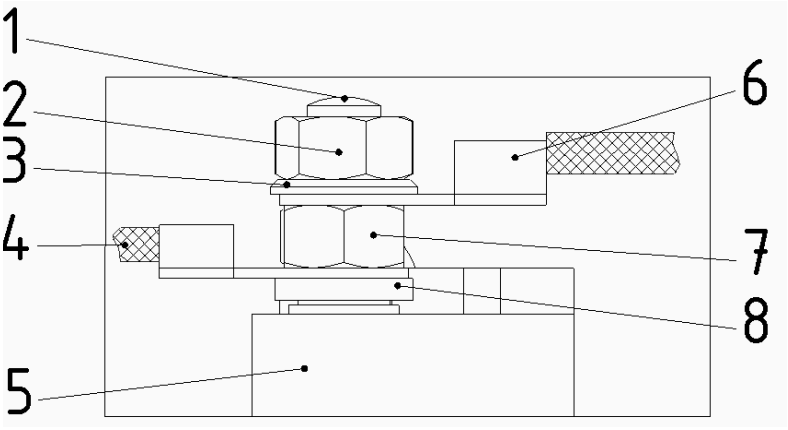


Braking contactor BS – CMSMB71



5.6.5 Power connection on terminal box

The following figure shows the power connection in the terminal box.



[1]	Terminal stud	[5]	Terminal board
[2]	Upper nut	[6]	Customer's cable
[3]	Washer	[7]	Lower nut
[4]	Motor cable	[8]	Lock washer

For designing the terminal box, positions 4, 6 and 7 are regarded as current-carrying.

Terminal stud diameter	Tightening torque of hex nut	Customer connection Cross section	Design	Connection type	Scope of delivery
M4	1.6 Nm	≤ 6 mm^2	Version 1b	Ring cable lug	Pre-assembled terminal links
		≤ 6 mm^2	Variant 2	Ring cable lug	Small connection accessories enclosed in bag
M5	2.0 Nm	≤ 10 mm^2	Variant 2	Ring cable lug	Small connection accessories enclosed in bag
M6	3.0 Nm	≤ 16 mm^2	Variant 3	Ring cable lug	Small connection accessories enclosed in bag
M8	6.0 Nm	≤ 25 mm^2	Variant 3	Ring cable lug	Premounted connection pieces
M10	10.0 Nm	≤ 50 mm^2	Variant 3	Ring cable lug	Premounted connection pieces

5.7 Accessory equipment

5.7.1 BP/BS brake

BP/BS holding brake – description

The mechanical brake is a holding brake implemented as a spring-loaded brake.

The brake cannot be retrofitted.

If the servomotors are operated on the MOVIAXIS® servo inverter, overvoltage protection is provided.

In every application, the BP/BS holding brake can be controlled via the BMV brake relay or a customer relay with varistor overvoltage protection.

If the system complies with the specifications for direct brake control, then a BP/BS brake can also be controlled directly via the brake output of a MOVIAXIS® servo inverter.

If the servomotors are operated on MOVIDRIVE® or inverters of other manufacturers, overvoltage protection must be implemented by the customers themselves using varistors, for example.

Observe the notes in the relevant operating instructions for the inverters concerning the switching sequence of motor enable and brake control during standard operation.

For the wiring diagrams of the brake controller, refer to section "Wiring diagrams of the BP/BS brake control" (page 47) and.

5.7.2 Thermal motor protection

NOTICE

Due to the low thermal time constants of the winding, thermal motor protection for CMS50 – CMP.71S motors is only possible when, in addition to a temperature sensor, a current monitoring device (I^2t, rms current monitoring) or a motor model for thermal protection, as installed in SEW servo systems, is activated.

Complete motor protection at full motor/electric cylinder utilization is only ensured if the signals are evaluated by SEW-EURODRIVE inverters.

Temperature sensor KTY84 – 130

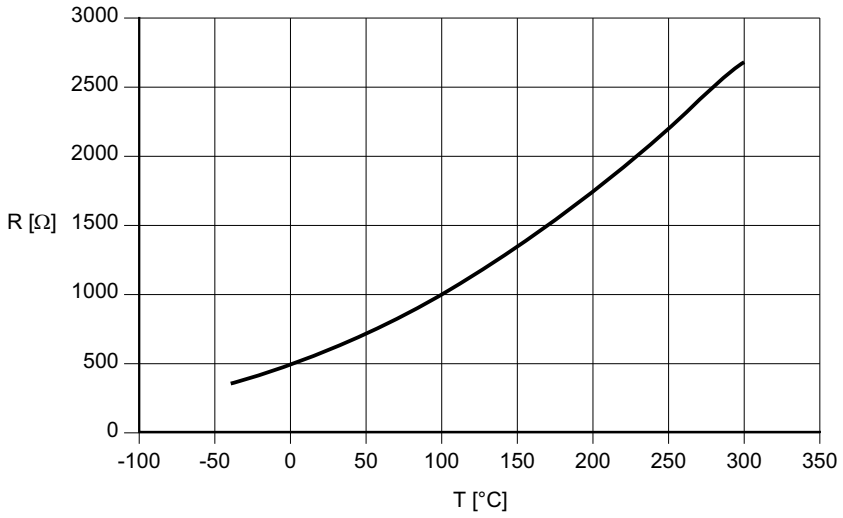
NOTICE

Possible damage to the temperature sensor and the motor winding

Use test currents < 3 mA in the circuit of the KTY sensor since high self-heating of the temperature sensor can damage its insulation and the motor winding.

Correct connection of the KTY is essential to ensure proper evaluation of the temperature sensor.

Typical characteristic curve of KTY:



For detailed information on connecting the KTY sensor, refer to the contact assignments of resolver/encoder cables. Observe the correct polarity.

5.7.3 VR forced cooling fan

For the electric cylinder sizes CMS50, CMSB63/71, CMSMB63/71, the synchronous servomotors can be equipped with a VR forced cooling fan as an option.

Electrical connection

⚠ NOTICE

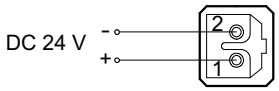
Starting up the fan before it is installed.

Risk of injury due to rotating parts.

- The fan may only be started up once it is installed.

The VR forced cooling fan is only available for DC 24 V voltage.

- DC 24 V ± 20 %
- Plug connector connection
- Maximum connection cross section 2 x 1 mm^2
- Pg7 cable gland with 7 mm inside diameter



Connector contact	Connection
1	24 V +
2	0 V

6 Startup

6.1 Important notes on startup

⚠ WARNING

Danger of electric shock.

Severe or fatal injuries.

- Observe the following notes.

- It is essential to comply with the safety notes in chapter 2 during installation!
- Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the motor and the brake.
- When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer.
- Observe the operating instructions of the servo inverter.

⚠ WARNING

With hoist applications, make sure that the holding torque of the brake is twice as big as the corresponding load torque of the application.

Severe or fatal injuries.

- Observe the project planning guidelines.
- The spindles that are used are not self-locking.
- See chapter "Possible maximum holding forces" (page 107).

⚠ WARNING

Series CMS electric cylinders may not execute any safety functions without master safety systems.

Severe or fatal injuries.

- Use master safety systems to ensure that equipment and personnel are protected.

⚠ WARNING

Incorrect use, installation or operation represents a crushing hazard due to the vertical movement of the spindle.

Severe or fatal injuries.

- Take measures to prevent inadvertent contact.

⚠ CAUTION

The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.

NOTICE

The rated speed (n_N) of the motor can be higher than the mechanically permitted speed (n_{epk}).

Possible damage to property.

- Limit the maximum speed at the servo inverter. For information on the procedure, refer to the documentation of the servo inverter.

NOTICE

With CMS..50 – 71 electric cylinders, the maximum limit torque (M_{pk}) and the maximum current (I_{max}) may not be exceeded, not even for acceleration.

Possible damage to property.

- Limit the maximum current/the maximum torque on the servo inverter.

6.2 Before startup

- The drive must be undamaged and not blocked.
- All connections have to be made correctly.
- All protective covers have to be fitted correctly.
- All motor protection devices must be active.
- There must not be any other sources of danger.
- The motor surface must not be covered by heat-sensitive or insulating materials.

7 Inspection/Maintenance

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the electric cylinder before you start working on the unit.
- Safeguard the electric cylinder against unintentional restart.

⚠ CAUTION

The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.

NOTICE

Improper inspection/maintenance may result in damages to the electric cylinder.

Possible damage to property.

- Note the following information.

- Strictly observe the safety notes in the individual chapters.
- Components may be subject to mechanical loads. Before removing the electric cylinder, ensure that the structure provided by the customer is supported and secured.
- Before starting work, isolate the electric cylinder and brake from the power supply. Secure the electric cylinder against unintended power-up.
- Use only genuine spare parts in accordance with the valid parts list.

7.1 General maintenance work

The electric cylinder is maintenance-free except for the threaded spindles. Replace defective parts if possible.

Remove any traces of dirt, chips, dust, etc. from the bellows (only CMS71L) with a soft cloth.

Mobile cables are subject to wear and must be checked for visible changes in regular intervals.

With CMSMB./AP with toothed belt, you have to replace the toothed belt in regular intervals.

7.2 Lubrication of the threaded spindle CMS50/CMS71

There may be a loss of lubricant between the nut and spindle in threaded spindles. Lubricants also decrease in quality and effectiveness with age and wear. This means lubrication is required at regular intervals.

The lubrication for threaded spindles is to be specified accurately in terms of type, quantity and relubrication intervals. These depend on:

- Load
- Velocity
- Cyclic duration factor
- Type of threaded spindle (recirculating ball screw or planetary screw drive)
- Ambient temperature
- Degree of pollution caused by dust, humidity, etc.

INFORMATION

The following information is intended as recommendations only. It is not intended to replace individual project planning for every application.

Permanent relubrication (for example via connection to lubrication system) is basically the preferred solution over lubrication at certain intervals.

Relubrication at intervals is not recommended for planetary screw drives, which can require about 2.5 times more lubricant than recirculating ball screws.

7.2.1 General information

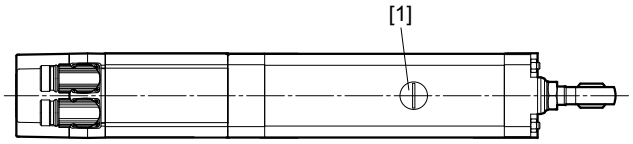
INFORMATION

The lubricating grease discharged into the electric cylinder accumulates inside the drive. Used lubricant must be removed from the inside of the motor after five years at the latest.

Service work must be performed by SEW employees only. During service work, the spindle must be removed from the unit and the old lubricant removed from the spindle's surface.

7.2.2 Size CMS50

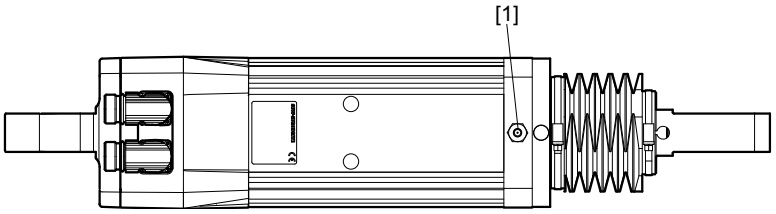
A taper greasing nipple DIN71412 [1] for manual relubrication with a grease gun is installed as standard on the spindle nut in the inside of the motor. The greasing nipple is accessible via screw plugs [1]. In order to reach it, slowly move the drive until the greasing nipple is visible.



4139224971

7.2.3 Size CMS71

A taper greasing nipple DIN71412 [1] for manual relubrication with a grease gun is installed as standard on the motor.



4139223051X

7.3 Recirculating ball screw/planetary roller screw drive lubricant – CMS50/CMS71

CMS electric cylinders are filled with the lubricant Fuchs RENOLIT CX-TOM15 as standard.

Instead, you can order the CMS50/71 motor with food-grade lubricant OBEEN FS 2 from Castrol.

INFORMATION

Only the following lubricants may be used for relubricating the electric cylinders.

Standard: Fuchs RENOLIT CX-TOM15

Food grade: Castrol OBEEN FS 2

Fuchs Renolit CX-TOM15 grease can be ordered from SEW in a 400 g cartridge (DIN1284) under **part no. 03207196**.

4139347851

The cartridge is suitable for grease guns in line with DIN1283 with adapter piece for DIN71412 grease nipples

4139349771

7.4 Relubrication interval

NOTICE

Improper relubrication may result in damages to the electric cylinder.

Possible damage to property.

- Observe the following notes.

- **The relubrication intervals must be determined individually depending on the load and cycle times. The following information only applies to the application examples described.**
- The drive must generally be relubricated once a year.
- The following information only applies to the application examples described.
- Always use the appropriate amount of lubricant for the individual application.
- If insufficient lubricant is applied, the lubricant film is disrupted and the service life thereby reduced.
- Excessive lubrication increases friction and results in heat generation.
- When relubricating the drive, always pay attention to cleanliness.
- There should be no dirt in the lubricant.
- Wipe the greasing nipple with a cloth before applying the grease gun.
- Make sure there is no trapped air in the lubricant or lubricant supply lines.

7.4.1 CMS50S with ball screw (KGT):

Example CMS50S, 5 mm/spindle pitch revolution

- 0.15 m travel distance
- Mean traveling velocity 0.15 m/s
- 1300 N load

Relubrication Relubrication quantity 1 cm^3

- After a travel distance of 200 km

or

- 20 million revolutions of the threaded spindle nut

7.4.2 CMS71L with ball screw (KGT):

Example

CMS71L, 10 mm/spindle pitch revolution

- 0.2 m travel distance
- Mean traveling velocity 0.2 m/s
- 4000 N load

continuous relubrication

0.8 cm^3/100 km = 0.008 cm^3/1 km

Relubrication intervals

Relubrication quantity 2 cm^3

- After a travel distance of 250 km

or

- 25 million revolutions of the threaded spindle nut

7.4.3 CMS71L with planetary roller screw drive (PGT):

Example

CMS71L, 5 mm/spindle pitch revolution

- 0.2 m travel distance
- Mean traveling velocity 0.2 m/s
- 4000 N load

continuous relubrication

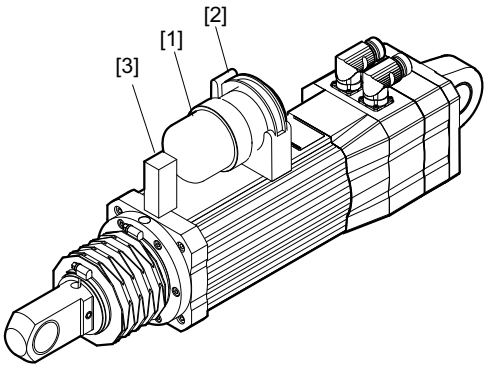
2 cm^3/100 km = 0.02 cm^3/1 km

7.5 Lubricator – only for CMS71

On request, the electric cylinder size CMS71L can be equipped with a lubricator. The threaded spindle nut is relubricated continuously with this option.

The lubricator comprises a drive unit with an electric motor, which is supplied with power either with a set of batteries (Vario lubrication system) or with 24 V and function monitoring (Control time/impulse lubrication system). This motor drains the lubricant container [1] via a piston. The Control lubrication system is connected to a customer control device via a cable (length 5 m, included in the scope of delivery).

The threaded elbow joints [3] are mounted, filled with lubricant and vented at the production plant.



4139253771

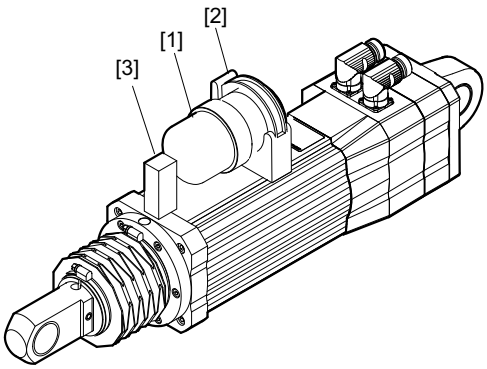
[1] Lubricant container
[2] Retaining clip
[3] Threaded elbow joint

INFORMATION

The time between lubrications is set to one year at the production plant and is sufficient for normal applications.

For cases with high annual operating time, e.g. 24 operating hours per day or an operational performance of > 2 km/day, consult SEW-EURODRIVE.

7.5.1 Lubricator variants



4139253771

[1] Lubricant container
[2] Retaining clip
[3] Threaded elbow joint

Star Vario (SV)

The Star Vario lubricator is powered by batteries, independent of the operating state of the electric cylinder. When the electric cylinder is started up, the Star Vario lubricator must be activated separately. Activate the lubricator by turning the rotary switch to the **ON** position. After activation, the lubricator **continuously** supplies the set lubricant quantity.

Star Vario divides the content of the lubricant container into several smaller dispensing cycles within the operating period. The factory setting of the lubricator is to dispense a **volume of 60 cm^3** over a **period of 12 months**.

Star Control Time (ST)

The Star Control Time lubricator is connected to the voltage supply or controller via cable. The lubricator **continuously** supplies the set lubricant quantity when the **supply voltage (24 V) is connected**. The status (function, fill level) of the lubricator can be monitored via the controller. For more information, see (page 109).

Star Control Time divides the content of the lubricant container into several smaller dispensing cycles within the operating period. The factory setting of the lubricator is to dispense a **volume of 0.69 cm^3** over a **period of 100 operating hours**.

Star Control Impulse (SI)

The Star Control Impulse lubricator is connected to the voltage supply or controller via cable. The lubricator dispenses the set lubricant quantity **in one amount** when the **supply voltage (24 V) is connected**. To dispense another amount of lubricant, the **voltage must be interrupted** and **connected again**. For more information see (page 110).

The status (function, fill level) of the lubricator can be monitored via the controller. The factory setting of the lubricator is to dispense a **volume of 0.53 cm^3** per impulse.

7.5.2 Wearing parts can be ordered from Perma.

The lubricant container [1] and the battery set (only for Vario) are wear and tear parts. They must be replaced after one year.

The parts can be ordered directly from Perma using the following part numbers:

Designation	Part no.:
Star lubricant container LC unit S60 Renolit CX-TOM15	1601085.385
Battery set (Vario)	21.000.000
Cable, 5 m (Control)	26.004.001

These parts cannot be ordered directly from SEW-EURODRIVE.

INFORMATION

There is no food grade lubricant for the lubricators.

7.5.3 Retrofit set from SEW-EURODRIVE

Complete lubrication systems can be ordered from SEW-EURODRIVE for retrofitting. The retrofit set consists of parts [1, 2] with the following part numbers:

Designation	Part no.:
Retrofit set lubricator cpl. Vario (SV)	1333 281 3
Retrofit set lubricator cpl. Control Time (ST)	1333 319 4
Retrofit set lubricator cpl. Control Impulse (SI)	1652 097 1

In addition, the following threaded elbow joint 1333 3178 [3] has to be ordered from SEW-EURODRIVE as it is **not included in the retrofit set**.

INFORMATION

When retrofitting, you must vent the threaded elbow joint [3].

7.6 Assembly and startup of the Star Vario / Star Control lubricator

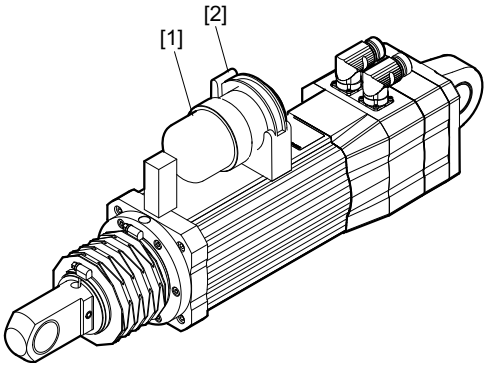
7.6.1 Assembly kit for lubricator

Assembly kit for lubricator

- Star Vario (SV) cpl. SEW part number 13332813
- Star Control Time (ST) cpl. SEW part number 13333194
- Star Control Impulse (SI) cpl. SEW part number 16520971

consists of the following individual components:

- 1 x Star Vario lubricator [1]
- or Star Control lubricator [1]
- 1 x clamp [2]
- 2 x machine screw M6x16



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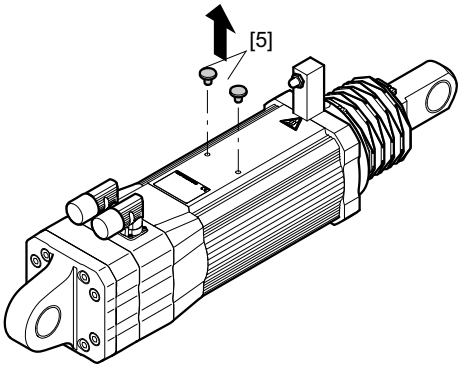
7.6.2 Assembly procedure

1. Remove the closing plug [5] from the motor housing.



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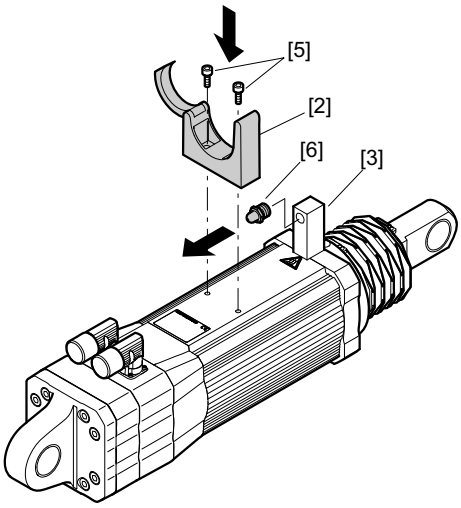
2. Mount the clamp [2] to the motor housing using 2 M6 machine screws [5]. Remove the greasing nipple [6] from the attached threaded elbow joint [3] and remove the closing plug from the lubricator.



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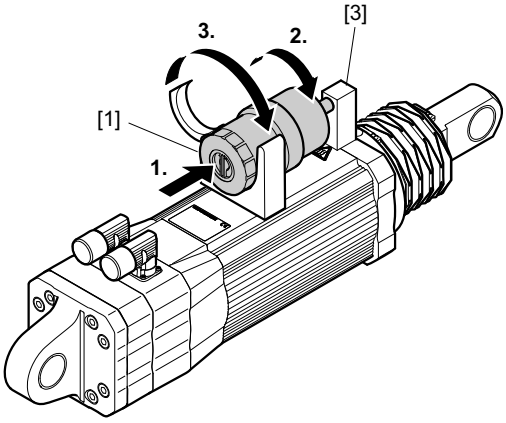
3. Place the lubricator [1] into the clamp and twist the lubricator into the threaded elbow joint [3]. Tighten the lubricator manually.



4139265291

4. Close the clamp by locking the top clamp arm into place.
5. For Star-Control, connect the cables to the voltage supply and the controller.

7.6.3 Retrofitting the lubricator

This requires the threaded elbow joint [3] (SEW part number: 13333178), see following figure.

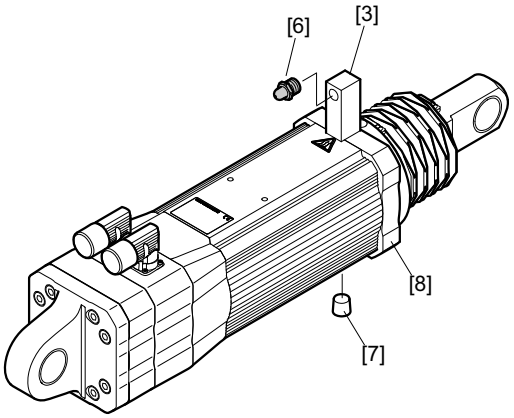
INFORMATION

The threaded elbow joint is not included in the assembly kit and must be ordered from SEW-EURODRIVE separately.

Trapped air in the lubrication system

INFORMATION

Air trapped in the lubrication system could lead to an inadequate supply of lubricant to the spindles. The system must be vented according to the steps described below.



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1. Remove the grease nipple from the cover plate [8].
2. Mount the threaded elbow angle [3], tighten it manually and insert the greasing nipple [6].
3. Release the screw plug [7] and remove it.
4. Press enough grease into the threaded elbow joint [3] until the grease escaping from the screw plug bore [7] has no bubbles.
5. Turn the screw plug [7] back in and tighten it.

For more information on assembly, see the assembly procedure (page 69) on

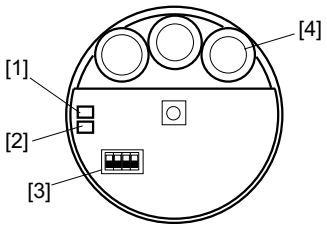
7.6.4 Lubricator startup

Star Vario (SV)

The code switches of the Star Vario variant are factory set to a dispensing time of 12 months or a dispensing volume of 60 cm^3, which is sufficient for standard applications.

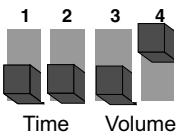
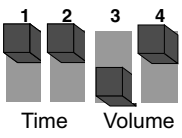
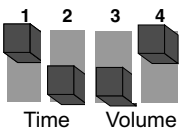
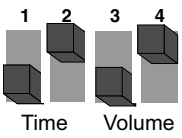
When the electric cylinder is started up, the Star Vario lubricator must be activated. Activate the lubricator by turning the rotary switch to the **ON** position.

Status display



[1] LED red
[2] LED green
[3] 4-way code switch
[5] Battery set

LED	Signal	Signal intervals	Operating state
Green	flashing	Every 15 seconds	Operation (OK)
Red	flashing	Every 8 seconds	Fault/malfunction
Green and red	flashing	Every 3 seconds	LC unit empty
Red	flashing	Constant	Vario dispensing

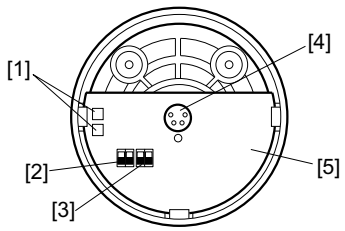
	12 months (SEW factory setting)	6 months	3 months	1 month
Runtime setting coding				
Dispensing volume per day	0.17 cm^3	0.33 cm^3	0.67 cm^3	2.0 cm^3

Star Control Time (ST)

The code switches of the Star Control Time variant are set to a dispensing quantity of 0.69 cm^3 for every 100 operating hours or a dispensing volume of 60 cm^3.

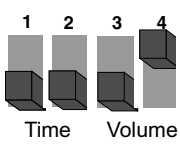
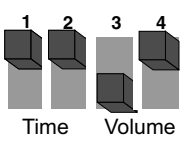
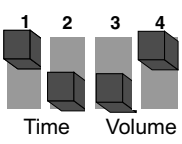
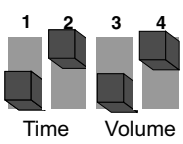
The Star Control Time variant is directly connected to the voltage supply and controller that control the lubricator in motor operation. Thus, a manual activation is not necessary.

Status display



[1] Function display
[2] Elevated "Time" switch
[3] "VOL" lowered switch
[4] Plug connection, pin assignment see (page 109)
[5] Board

LED	Signal	Description
Green	Constant signal	OK = System functioning
Red	Constant signal < 30 s with motor start-up	Dispensing action
Red	Constant signal > 30 s	Fault/malfunction
Green and red	Constant signal	LC unit empty, replace

	(SEW factory setting)			
Runtime setting coding				
Dispensing quantity for every 100 operating hours	0.69 cm^3	1.39 cm^3	2.78 cm^3	8.33 cm^3

INFORMATION

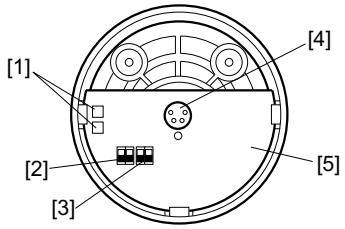
As soon as the voltage (15 - 25 V_{DC}, max. 30 V_{DC}) is present, the lubricator dispenses the set volume in determined time intervals. The voltage must be present for at least 2 minutes to ensure the correct operating time.

Star Control Impulse (SI)

The code switches of the Star Control Impulse variant are set to a dispensing quantity of 0.53 cm^3 per impulse or a dispensing volume of 60 cm^3.

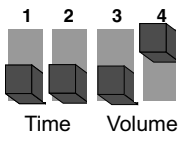
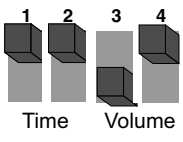
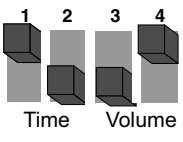
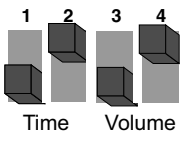
The Star Control Impulse variant is directly connected to the voltage supply and controller that control the lubricator in motor operation. Thus, a manual activation is not necessary.

Status display



[1] Function display
[2] "Time" elevated switch
[3] "VOL" lowered switch
[4] Plug connection, pin assignment see (page 110)
[5] Board

LED	Signal	Description
Green	Constant signal	OK = System functioning
Red	Constant signal < 30 s with motor start-up	Dispensing action
Red	Constant signal > 30 s	Fault/malfunction
Green and red	Constant signal	LC unit empty, replace

		(SEW factory setting)		
Runtime setting coding				
Dispensing volume per impulse	0.26 cm^3	0.53 cm^3	1.06 cm^3	2.11 cm^3

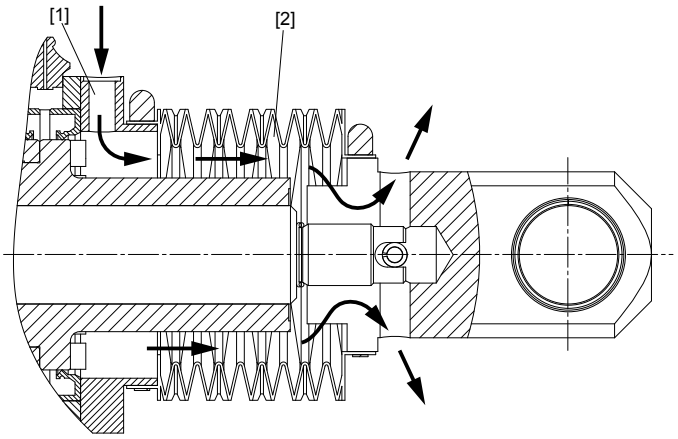
INFORMATION

- As soon as the voltage (15 - 25 V_{DC}, max. 30 V_{DC}) is present, the lubricator dispenses the set volume once. The voltage must be present long enough for the dispensing process to be completed (max 2 minutes).
- The voltage supply must be interrupted for at least 15 seconds and re-connected for each dispensing process.

7.7 Sealing air

At the factory, the drive is equipped with a sealing air connection [1] thread G1/8 as standard. This is why the electric cylinder can be used in dusty environments in particular.

In this case, the space within the bellows [2] can be placed under slight positive pressure (max. 0.5 bar). The positive pressure prevents dust, etc., from entering the motor.



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[1] Sealing air connection
[2] Bellows

The pressurized air volume flow ($V_{Sealingair}$) that is required depends on the travel speed (v) of the threaded spindle.

$V_{sealing\ air} \geq 300\ v$	Volume flow $V_{Sealingair}$ [Liter/min]
	Travel speed v [m/s]

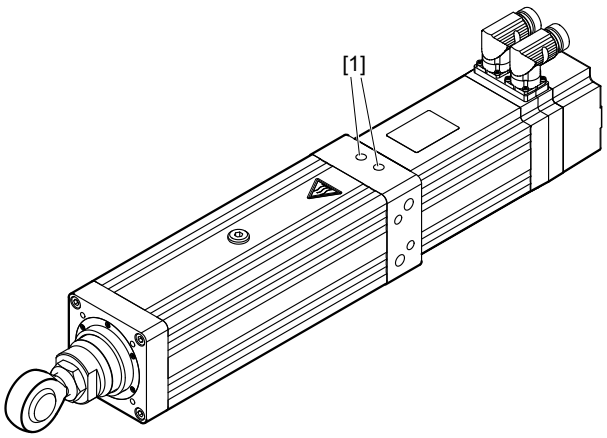
This ensures that sufficient pressurized air flows in during extension and that no negative pressure develops in the space [2].

The pressurized air must be dry and free of oil, according to DIN-ISO 8573-1 class 3 (common in pressurized air systems).

7.8 Water cooling am CMSB63/71, CMSMB63/71

The CMSB63/71, CMSMB63/71 is equipped with a water cooling connection option as standard.

The inlet and outlet connections for the cooling water can be swapped.



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[1] Cooling water connection 2x G1/8 (flange seal and screw fitting supplied by the customer)

Water cooling can increase the thermal capacity of the drive by up to 25 %. The data for water cooling in the power diagrams for the thermal limit torque are based on the following parameters:

- Temperature of cooling water inlet 25 °C
- Temperature increase at cooling water outlet about 5 °C
- Flow rate CMSB63/71: 4 l/min
- Flow rate CMSMB63/71: 8 l/min

Higher flow rates increase the cooling effect only slightly.

Cooling water requirements:

- Max. operating pressure 2 bar
- demineralized and desalinated
- No foreign objects and sediments
- Frost protection, if necessary

The components through which the cooling waters flows are corrosion-protected. The cooling water must not contain any chemically aggressive additives; contact SEW if necessary.

7.9 Filter ventilation CMS71

If the electric cylinder CMS71 is used in dusty environments, you must make sure that no dust is sucked in through the vent [4] of the bellows in the joint during the lifting motion.

There are two possibilities to do so:

- Sealing air
- Filter ventilation (no compressed air required)

INFORMATION

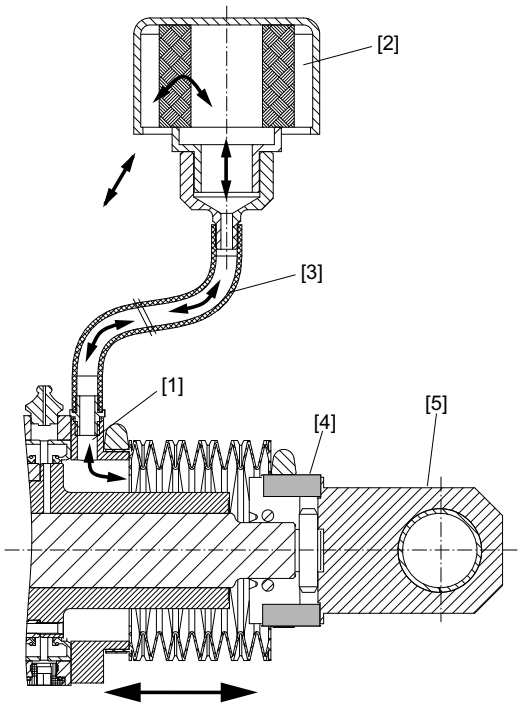
The filter ventilation is not included in the SEW-EURODRIVE delivery

For this purpose, a suitable filter [2] is installed at the sealing air connection [1] with G1/8 thread. If there is not enough space, the filter can be connected to the electric cylinder via a hose [3]. Max. hose length 1 m, inner diameter > 9 mm.

SEW recommends a type L1.0807-11 filter from Argo-Hythos http://www.argo-hytos.com. This is an inexpensive filter that is used for venting hydraulic vessels on construction machines

This filter safely keeps back dust particles < 3 µm under very low pressure. Other filters, such as pneumatic mufflers, sintered metal filters, etc., must not be used.

In addition to this, the default ventilation via the joint must be sealed. The sealed joint can be ordered under "Option without bellows ventilation" or retrofitted using 2 x sealing element [4], SEW part no. 13342093. Older versions are sealed with rubber.



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[1] Sealing air connection
[2] Filter
[3] Hose
[4] Sealing element
[5] Joint

7.10 Oil bath lubrication for CMSB63/71, CMSMB63/71

The CMSB63/71, CMSMB63/71 electric cylinders are equipped with an oil bath lubrication with little maintenance requirements. The only required maintenance measure is a regular visual check for leaks. The oil need not be changed in usual applications.

An oil change might make sense for applications with the following higher requirements:

- Travel cycles with a cyclic duration factor > 60% and an operational performance of > 1 km/hour.
- Working strokes < 10 mm with stroke frequencies > 5 Hz
- Expected service life > 10000 hours of nominal operation

Please contact SEW-EURODRIVE in such cases.

CMSB63/71, CMSMB63/71 electric cylinders are filled at the plant with the lubricant Mobil SHC630 as standard. This lubricant is used for recirculating ball screws and planetary roller screws.

Instead, you can order CMSB63/71, CMSMB63/71 with food-grade Castrol OPTIMOL OPTILEB GT from SEW-EURODRIVE.

7.11 Size CMSB63/71 and CMSMB63/71 with oil lubrication

INFORMATION

The oil screw plug of the electric cylinder must not be opened.

The sealing system and the components have been developed and tested to complement each other. Observe the following notes in order not to reduce the service life:

- Do not paint the piston rod
- Do not expose the piston rod to potential damage resulting from hard components
- Protect the piston rod from clinging foreign substances (e.g. cleaning agent, spatters)
- Make sure that the joints are free to move
- Visually check for any leakages regularly, at least every other week

7.11.1 Replacement interval of wearing parts

The drive reaches the end of its service life after 10 000 hours of nominal operation. A general overhaul and refit of the drive is not recommended.

Electric cylinder	Replacement intervals of the components	
CMSB63/71, CMSMB63/71	Threaded spindle	Not necessary
	A- and B-end bearing	Not necessary
	Gasket	Not necessary
CMSMB63/71/AP	Toothed belt	7.5 million double strokes

7.12 Size CMS50 and CMS71 with grease lubrication

The drive reaches the end of its service life after 10 000 hours of nominal operation. A general overhaul and refit of the drive is not recommended.

Replacement intervals of the components	
Threaded spindle	Not necessary
A- and B-end bearing	Not necessary
Oil seals	After half of the service life (5000 hours)[1)]
Plain bearing bush	Provided by the customer[1)]
Bellows	After half of the service life (5000 hours)[1)]

1) only for CMS71L

7.13 Operating life

An estimated service life of the electric cylinders of 10000 operating hours can be achieved based on the loads listed in the following table:

CMS type		Mean speed [rpm]	eff. Force [N]	Operational performance [km]
CMS50	KGT 15x5	400	1200	280
CMSB63	KGT 25x6	1000	2400	4500
CMSB63	PGT 20x5	1000	2800	1400
CMS71	KGT 32x6	400	3600	1400
CMS71	KGT 32x6	400	6700	170
CMS71	KGT 32x10	400	3600	2400
CMS71	PGT 24x5	400	7200	100
CMSB71	KGT 32x6	1000	5000	2100

The following conditions apply:

- Horizontal mounting position
- Max. acceleration with M_0
- Ambient temperature 5-40°C
- Steady motion without impulsive loads

8 Technical Data

8.1 Key to the data tables

The following table lists the short symbols used in the "Technical data" tables.

n_N	Nominal speed
n_{epk}	Maximum mechanically permitted speed
M_0	Standstill torque (thermal continuous torque at a speed of 5 to 50 rpm)
M_{0VR}	Standstill torque (thermal continuous torque at a speed of 5 to 50 rpm) with forced cooling fan
I_0	Standstill current
I_{0VR}	Standstill current with forced cooling fan
M_{pk}	Maximum limit torque
I_{max}	maximum current
J_{mot}	Mass moment of inertia without brake [1]
J_{bmot}	Mass moment of inertia with brake
J_{zusatz}	additional mass moment of inertia without brake [2]
$J_{bzusatz}$	Additional mass moment of inertia with brake[2]
M_B	Braking torque
L_1	Inductance between connection phase and star point
R_1	Resistance between connection phase and star point
U_{p0kalt}	Magnet wheel voltage at 1000 rpm
P	Spindle pitch
D	Nominal spindle diameter
F	Maximum permanent feed force
F_{VR}	Maximum permanent feed force with forced cooling fan
F_{pk}	Peak feed force [3]
m	Weight, variant without brake
m_{VR}	Weight, variant without brake, with forced cooling fan
m_{bmot}	Weight, variant with brake
m_{bmotVR}	Weight, variant with brake and forced cooling fan

1) for the complete motor and spindle

2) for project planning with SEW Workbench

3) Depending on max. inverter current, dynamic or static load of spindle; please contact SEW-EURODRIVE prior to project planning with maximum force.

8.2 General features

Design	
Thermal class	F (155 °C)
Ambient temperature	-20 °C to +40 °C[1]
Noise levels / EN 60034	Below specified value
Vibration class	"B" to EN60034-14
Positioning accuracy (repetition accuracy) at constant force and temperature	± 0.05 mm

1) CMS71 with brake -5°C – 40°C

8.3 CMS50

8.3.1 Features

The table below shows the features.

Design	Standard	Optional
Degree of protection	IP65	
Motor protection	KTY	
Mounting position	any	
Cooling	Natural convection	VR forced cooling fan
Lubrication	Via housing bore, with taper greasing nipple DIN 71412-A	Food grade lubricant
Spindle protection	Smooth piston rod with sealing system	

8.3.2 Technical data

INFORMATION

Stroke length 300 mm n_{epk} = 2500 rpm (max. mechanical speed)

Stroke lengths 70 and 150 mm n_{epk} = 4500 rpm (max. mechanical speed)

The following tables show the technical data.

CMS50S

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm^2]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 15x5	3000	70	1.3	0.96	5.2	5.1	0.54	0.6	0.12	4.3	71	22.49	86	1.2	5.3	5.8	6.4
		150					0.56	0.62	0.14							6.5	7.1
		300					0.61	0.67	0.19							7.8	8.4
	4500	70	1.3	1.32	5.2	7.0	0.54	0.6	0.12	4.3	37	11.61	62	1.2	5.3	5.8	6.4
		150					0.56	0.62	0.14							6.5	7.1
		300					0.61	0.67	0.19							7.8	8.4
	6000	70	1.3	1.7	5.2	9.0	0.54	0.6	0.12	4.3	22.5	7.11	48.5	1.2	5.3	5.8	6.4
		150					0.56	0.62	0.14							6.5	7.1
		300					0.61	0.67	0.19							7.8	8.4

CMS50M

NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm^2]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 15x5	3000	70	2.4	1.68	5.2[1] (10.3)[2]	3.6[3] (9.6)[2]	0.79	0.85	0.12	4.3	38.5	9.96	90	2.2	5.3	6.8	7.4
		150					0.81	0.87	0.14							7.5	8.1
		300					0.86	0.92	0.19							8.8	9.4
	4500	70	2.4	2.3	5.2[1] (10.3)[2]	5.0[3] (13.1)[2]	0.79	0.85	0.12	4.3	20.5	5.28	66	2.2	5.3	6.8	7.4
		150					0.81	0.87	0.14							7.5	8.1
		300					0.86	0.92	0.19							8.8	9.4
	6000	70	2.4	3.0	5.2[1] (10.3)[2]	6.5[3] (17.1)[2]	0.79	0.85	0.12	4.3	12.0	3.21	50.5	2.2	5.3	6.8	7.4
		150					0.81	0.87	0.14							7.5	8.1
		300					0.86	0.92	0.19							8.8	9.4

1) Maximum permitted torque

2) Standard motor values

3) Maximum permitted current

8.4 CMSB63, CMSMB63

8.4.1 Features

The table below shows the features.

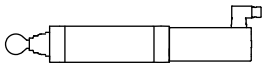
Design	Standard	Optional
Degree of protection	IP65	
Motor protection	KTY	
Mounting position	M0	
Cooling	Natural convection/water cooling	VR forced cooling fan
Lubrication	Oil bath lubrication	Food grade lubricant
Spindle protection	Smooth piston rod with sealing system	

8.4.2 Technical data

INFORMATION

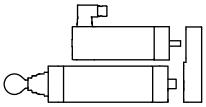
Stroke lengths 100, 160, 180, 200, 400 and 600 mm n_{epk} = 4500 rpm (max. mechanical speed)

CMSB63S



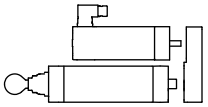
Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 25x6	3000	100	2.9	2.15	11.1	12.9	1.92	2.26	0.77	9.3	36.5	6.79	90	2.4	10	9.5	10.5
		200					2.24	2.58	1.09							11	12
		400					2.64	2.98	1.49							15	16
		600					3.1	3.44	1.95							18	19
	4500	100	2.9	3.05	11.1	18.3	1.92	2.26	0.77	9.3	18.3	3.34	64	2.4	10	9.5	10.5
		200					2.24	2.58	1.09							11	12
		400					2.64	2.98	1.49							15	16
		600					3.1	3.44	1.95							18	19
	6000	100	2.9	3.9	11.1	23.4	1.92	2.26	0.77	9.3	11.2	2.1	50	2.4	10	9.5	10.5
		200					2.24	2.58	1.09							11	12
		400					2.64	2.98	1.49							15	16
		600					3.1	3.44	1.95							18	19
PGT 20x5	3000	100	2.9	2.15	11.1	12.9	1.69	2.03	0.54	9.3	36.5	6.79	90	2.8	10	9.5	10.5
		200					1.81	2.15	0.66							11	12
	4500	100		3.05		18.3	1.69	2.03	0.54		18.3	3.34	64			9.5	10.5
		200					1.81	2.15	0.66							11	12
	6000	100		3.9		23.4	1.69	2.03	0.54		11.2	2.1	50			9.5	10.5
		200					1.81	2.15	0.66							11	12

CMSMB63/AP with CMP63S without belt transmission



Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 25x6	**3000**	100	2.9	2.15	11.1	12.9	4.47	4.81	3.32	9.3	36.5	6.79	90	2.4	10	12.2	13.2
		160					4.64	4.95	3.46							13.1	14.1
		180					4.66	5.00	3.51							13.6	14.6
		200					4.70	5.04	3.55							14.4	15.4
		400					5.19	5.53	4.04							18.0	19.0
		600					5.65	5.99	4.50							21.3	22.3
KGT 25x6	**4500**	100	2.9	3.05	11.1	18.3	4.47	4.81	3.32	9.3	18.3	3.34	64	2.4	10	12.2	13.2
		160					4.64	4.95	3.46							13.1	14.1
		180					4.66	5.00	3.51							13.6	14.6
		200					4.70	5.04	3.55							14.4	15.4
		400					5.19	5.53	4.04							18.0	19.0
		600					5.65	5.99	4.50							21.3	22.3
KGT 25x6	**6000**	100	2.9	3.9	11.1	23.4	4.47	4.81	3.32	9.3	11.2	2.1	50	2.4	10	12.2	13.2
		160					4.64	4.95	3.46							13.1	14.1
		180					4.66	5.00	3.51							13.6	14.6
		200					4.70	5.04	3.55							14.4	15.4
		400					5.19	5.53	4.04							18.0	19.0
		600					5.65	5.99	4.50							21.3	22.3

CMSMB63/AP with CMP63S with belt transmission 41/25 ~ 1.64



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

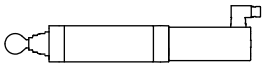
Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm²]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 25x6	3000	100	2.9	2.15	6.8[1] (11.1)[2]	5.8[3] (12.9)[2]	4.04	4.38	2.89	9.3	36.5	6.79	90	3.6	10	12.2	13.2
		160					4.21	4.55	3.06							13.1	14.1
		180					4.27	4.61	3.12							13.6	14.6
		200					4.33	4.67	3.18							14.4	15.4
		400					4.93	5.27	3.78							18.0	19.0
		600					5.50	5.84	4.35							21.3	22.3
KGT 25x6	4500	100	2.9	3.05	6.8[1] (11.1)[2]	8.2[3] (18.3)[2]	4.04	4.38	2.89	9.3	18.3	3.34	64	3.6	10	12.2	13.2
		160					4.21	4.55	3.06							13.1	14.1
		180					4.27	4.61	3.12							13.6	14.6
		200					4.33	4.67	3.18							14.4	15.4
		400					4.93	5.27	3.78							18.0	19.0
		600					5.50	5.84	4.35							21.3	22.3
KGT 25x6	6000	100	2.9	3.9	6.8[1] (11.1)[2]	10.5[3] (23.4)[2]	4.04	4.38	2.89	9.3	11.2	2.1	50	3.6	10	12.2	13.2
		160					4.21	4.55	3.06							13.1	14.1
		180					4.27	4.61	3.12							13.6	14.6
		200					4.33	4.67	3.18							14.4	15.4
		400					4.93	5.27	3.78							18.0	19.0
		600					5.50	5.84	4.35							21.3	22.3

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

CMSB63M



NOTICE

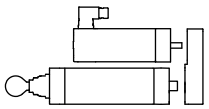
Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 25x6	3000	100	5.3	3.6	11.1[1] (21.4)[2]	7.9[3] (21.6)[2]	2.69	3.03	0.77	9.3	22	3.56	100	4.1	10	11	12
		200					3.01	3.35	1.09							12.5	13.5
		400					3.41	3.75	1.49							16.5	17.5
		600					3.87	4.21	1.95							19.5	20.5
	4500	100	5.3	5.4		11.9[3] (32.4)[2]	2.69	3.03	0.77	9.3	9.8	1.48	67	4.1	10	11	12
		200					3.01	3.35	1.09							12.5	13.5
		400					3.41	3.75	1.49							16.5	17.5
		600					3.87	4.21	1.95							19.5	20.5
	6000	100	5.3	6.9		15.2[3] (41.4)[2]	2.69	3.03	0.77	9.3	5.9	0.92	52	4.1	10	11	12
		200					3.01	3.35	1.09							12.5	13.5
		400					3.41	3.75	1.49							16.5	17.5
		600					3.87	4.21	1.95							19.5	20.5
PGT 20x5	3000	100	5.3	3.6	11.1[1] (21.4)[2]	7.9[3] (21.6)[2]	2.46	2.8	0.54	9.3	22	3.56	100	5.2	10	11	12
		200					2.58	2.92	0.66							12.5	13.5
	4500	100	5.3	5.4		11.9[3] (32.4)[2]	2.46	2.8	0.54		9.8	1.48	67			11	12
		200					2.58	2.92	0.66							12.5	13.5
	6000	100	5.3	6.9		15.2[3] (41.4)[2]	2.46	2.8	0.54		5.9	0.92	52			11	12
		200					2.58	2.92	0.66							12.5	13.5

1) Max. permitted torque
2) Standard motor values
3) Max. permitted current

CMSMB63/AP with CMP63M without belt transmission



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

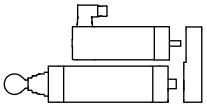
Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 25x6	3000	100	5.3	3.6	11.1[1] (21.4)[2]	7.9[3] (21.6)[2]	5.24	5.58	3.32	9.3	22	3.56	100	3.6		13.9	14.9
		160					5.38	5.72	3.42							14.8	15.8
		180					5.43	5.77	3.51							15.3	16.3
		200					5.47	5.81	3.55							16.1	17.1
		400					5.96	6.30	4.04							19.7	20.7
		600					6.42	6.76	4.50							23.0	24.0
KGT 25x6	4500	100	5.3	5.4	11.1[1] (21.4)[2]	11.9[3] (32.4)[2]	5.24	5.58	3.32	9.3	9.8	1.48	67	3.6	10	13.9	14.9
		160					5.38	5.72	3.42							14.8	15.8
		180					5.43	5.77	3.51							15.3	16.3
		200					5.47	5.81	3.55							16.1	17.1
		400					5.96	6.30	4.04							19.7	20.7
		600					6.42	6.76	4.50							23.0	24.0
KGT 25x6	6000	100	5.3	6.9	11.1[1] (21.4)[2]	15.2[3] (41.4)[2]	5.24	5.58	3.32	9.3	5.9	3.56	52	3.6	10	13.9	14.9
		160					5.38	5.72	3.42							14.8	15.8
		180					5.43	5.77	3.51							15.3	16.3
		200					5.47	5.81	3.55							16.1	17.1
		400					5.96	6.30	4.04							19.7	20.7
		600					6.42	6.76	4.50							23.0	24.0

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

CMSMB63/AP with CMP63M with belt transmission 41/25 ~ 1.64



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

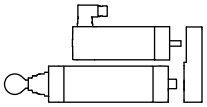
Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm²]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 25x6	3000	100	5.3	3.6	6.8[1] (21.4)[2]	4.7[3] (21.6)[2]	4.81	5.15	2.89	9.3	22	3.56	100	5.5	10	13.9	14.9
		160	5.3	3.6			4.98	5.32	3.06							14.8	15.8
		180	5.3	3.6			5.04	5.38	3.12							15.3	16.3
		200	5.3	3.6			5.10	5.44	3.18							16.1	17.1
		400	5.3	3.6			5.70	6.04	3.78							19.7	20.7
		600	5.3	3.6			6.27	6.61	4.35							23.0	24.0
KGT 25x6	4500	100	5.3	5.4	6.8[1] (21.4)[2]	7.0[3] (32.4)[2]	4.81	5.15	2.89	9.3	9.8	1.48	67	5.5	10	13.9	14.9
		160	5.3	5.4			4.98	5.32	3.06							14.8	15.8
		180	5.3	5.4			5.04	5.38	3.12							15.3	16.3
		200	5.3	5.4			5.10	5.44	3.18							16.1	17.1
		400	5.3	5.4			5.70	6.04	3.78							19.7	20.7
		600	5.3	5.4			6.27	6.61	4.35							23.0	24.0
KGT 25x6	6000	100	5.3	6.9	6.8[1] (21.4)[2]	9.0[3] (41.4)[2]	4.81	5.15	2.89	9.3	5.9	3.56	52	5.5	10	13.9	14.9
		160	5.3	6.9			4.98	5.32	3.06							14.8	15.8
		180	5.3	6.9			5.04	5.38	3.12							15.3	16.3
		200	5.3	6.9			5.10	5.44	3.18							16.1	17.1
		400	5.3	6.9			5.70	6.04	3.78							19.7	20.7
		600	5.3	6.9			6.27	6.61	4.35							23.0	24.0

1) Max. permitted torque

2) Standard values of motor

3) Max. permitted current

CMSMB63/AP with CMP63L without belt transmission



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

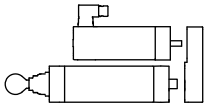
Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 25x6	3000	100	7.1	4.95	11.1[1] (30.4)[2]	7.9[3] (29.7)[2]	6.01	6.35	3.32	9.3	14.2	2.07	100	4.8	10	15.7	16.7
		160					6.15	6.49	3.46							16.6	17.6
		180					6.20	6.54	3.51							17.1	18.1
		200					6.24	6.58	3.55							17.9	18.9
		400					6.73	7.07	4.04							21.5	22.5
		600					7.19	7.53	4.50							24.8	25.8
KGT 25x6	4500	100	7.1	6.90	11.1[1] (30.4)[2]	11.0[3] (41.4)[2]	6.01	6.35	3.32	9.3	7.2	1.07	71	4.8	10	15.7	16.7
		160					6.15	6.49	3.46							16.6	17.6
		180					6.20	6.54	3.51							17.1	18.1
		200					6.24	6.58	3.55							17.9	18.9
		400					6.73	7.07	4.04							21.5	22.5
		600					7.19	7.53	4.50							24.8	25.8
KGT 25x6	6000	100	7.1	9.3	11.1[1] (30.4)[2]	14.9[3] (55.8)[2]	6.01	6.35	3.32	9.3	4.0	0.62	53	4.8	10	15.7	16.7
		160					6.15	6.49	3.46							16.6	17.6
		180					6.20	6.54	3.51							17.1	18.1
		200					6.24	6.58	3.55							17.9	18.9
		400					6.73	7.07	4.04							21.5	22.5
		600					7.19	7.53	4.50							24.8	25.8

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

CMSMB63/AP with CMP63L with belt transmission 41/25 ~ 1.64



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 25x6	3000	100	7.1	4.95	6.8[1] (30.4)[2]	4.7[3] (29.7)[2]	5.58	5.92	2.89	9.3	14.2	2.07	100	7.3	10	15.7	16.7
		160					5.75	6.09	3.06							16.6	17.6
		180					5.81	6.15	3.12							17.1	18.1
		200					5.87	6.21	3.18							17.9	18.9
		400					6.47	6.81	3.78							21.5	22.5
		600					7.04	7.38	4.35							24.8	25.8
KGT 25x6	4500	100	7.1	6.90	6.8[1] (30.4)[2]	7.0[3] (41.4)[2]	5.58	5.92	2.89	9.3	7.2	1.07	71	7.3	10	15.7	16.7
		160					5.75	6.09	3.06							16.6	17.6
		180					5.81	6.15	3.12							17.1	18.1
		200					5.87	6.21	3.18							17.9	18.9
		400					6.47	6.81	3.78							21.5	22.5
		600					7.04	7.38	4.35							24.8	25.8
KGT 25x6	6000	100	7.1	9.3	6.8[1] (30.4)[2]	9.5[3] (55.8)[2]	5.58	5.92	2.89	9.3	4.0	0.62	53	7.3	10	15.7	16.7
		160					5.75	6.09	3.06							16.6	17.6
		180					5.81	6.15	3.12							17.1	18.1
		200					5.87	6.21	3.18							17.9	18.9
		400					6.47	6.81	3.78							21.5	22.5
		600					7.04	7.38	4.35							24.8	25.8

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

8.5 CMSB71, CMSMB71

8.5.1 Features

The table below shows the features.

Design	Standard	Optional
Degree of protection	IP65	
Motor protection	KTY	
Mounting position	M0	
Cooling	Natural convection/water cooling	VR forced cooling fan
Lubrication	Oil bath lubrication	Food grade lubricant
Spindle protection	Smooth piston rod with sealing system	

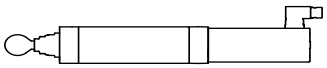
8.5.2 Technical data

INFORMATION

Stroke length 100, 160, 200, 400, 600, 800, 1000 and 1200 mm → n_{epk} = 4500 rpm (max. mechanical speed)

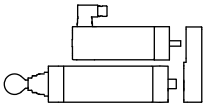
The following tables show the technical data.

CMSB71S



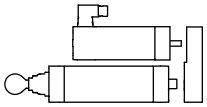
Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 32x6	2000	100	6.4	3.9	19.2	17.0	7.17	7.59	4.14	14	33.5	3.48	128	5.0	18	20.2	21.2
		160					7.54	7.96	4.51							21.6	23.6
		200					7.78	8.20	4.75							22.5	24.5
		400					9.10	9.52	6.07							29.3	30.3
		600					10.32	10.74	7.29							33.9	34.9
		800					11.54	11.96	8.51							38.1	39.1
		1000					12.77	13.19	9.74							42.7	43.7
		1200					13.99	14.41	10.96							47.3	48.3
KGT 32x6	3000	100	6.4	4.9	19.2	25.0	7.17	7.59	4.14	14	15.7	1.48	87.5	5.0	18	20.2	21.2
		160					7.54	7.96	4.51							21.6	23.6
		200					7.78	8.20	4.75							22.5	24.5
		400					9.10	9.52	6.07							29.3	30.3
		600					10.32	10.74	7.29							33.9	34.9
		800					11.54	11.96	8.51							38.1	39.1
		1000					12.77	13.19	9.74							42.7	43.7
		1200					13.99	14.41	10.96							47.3	48.3
KGT 32x6	4500	100	6.4	7.3	19.2	38.0	7.17	7.59	4.14	14	7.1	0.72	59	5.0	18	20.2	21.2
		160					7.54	7.96	4.51							21.6	23.6
		200					7.78	8.20	4.75							22.5	24.5
		400					9.10	9.52	6.07							29.3	30.3
		600					10.32	10.74	7.29							33.9	34.9
		800					11.54	11.96	8.51							38.1	39.1
		1000					12.77	13.19	9.74							42.7	43.7
		1200					13.99	14.41	10.96							47.3	48.3
KGT 32x6	6000	100	6.4	9.6	19.2	50.0	7.17	7.59	4.14	14	4.15	0,395	45	5.0	18	20.2	21.2
		160					7.54	7.96	4.51							21.6	23.6
		200					7.78	8.20	4.75							22.5	24.5
		400					9.10	9.52	6.07							29.3	30.3
		600					10.32	10.74	7.29							33.9	34.9
		800					11.54	11.96	8.51							38.1	39.1
		1000					12.77	13.19	9.74							42.7	43.7
		1200					13.99	14.41	10.96							47.3	48.3

CMSMB71/AP with CMP71S without belt transmission



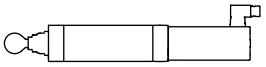
Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm^2]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 32x6	2000	100	6.4	3.4	19.2	17.0	16.67	17.09	14.06	14	33.5	3.48	128	5.0	18	24.2	26.2
		160					17.04	17.46	14.43							25.6	27.6
		200					17.28	17.70	14.67							26.5	28.5
		400					18.60	19.02	15.99							33.3	35.3
		600					19.82	20.24	17.21							37.9	39.9
		800					21.04	21.46	18.43							42.1	44.1
		1000					22.26	22.68	19.65							46.7	48.7
		1200					23.49	23.91	20.88							51.3	53.3
KGT 32x6	3000	100	6.4	4.9	19.2	25.0	16.67	17.09	14.06	14	15.7	1.48	87.5	5.0	18	24.2	26.2
		160					17.04	17.46	14.43							25.6	27.6
		200					17.28	17.70	14.67							26.5	28.5
		400					18.60	19.02	15.99							33.3	35.3
		600					19.82	20.24	17.21							37.9	39.9
		800					21.04	21.46	18.43							42.1	44.1
		1000					22.26	22.68	19.65							46.7	48.7
		1200					23.49	23.91	20.88							51.3	53.3
KGT 32x6	4500	100	6.4	7.3	19.2	38.0	16.67	17.09	14.06	14	7.1	0.72	59	5.0	18	24.2	26.2
		160					17.04	17.46	14.43							25.6	27.6
		200					17.28	17.70	14.67							26.5	28.5
		400					18.60	19.02	15.99							33.3	35.3
		600					19.82	20.24	17.21							37.9	39.9
		800					21.04	21.46	18.43							42.1	44.1
		1000					22.26	22.68	19.65							46.7	48.7
		1200					23.49	23.91	20.88							51.3	53.3
KGT 32x6	6000	100	6.4	9.6	19.2	50.0	16.67	17.09	14.06	14	4.15	0,395	45	5.0	18	24.2	26.2
		160					17.04	17.46	14.43							25.6	27.6
		200					17.28	17.70	14.67							26.5	28.5
		400					18.60	19.02	15.99							33.3	35.3
		600					19.82	20.24	17.21							37.9	39.9
		800					21.04	21.46	18.43							42.1	44.1
		1000					22.26	22.68	19.65							46.7	48.7
		1200					23.49	23.91	20.88							51.3	53.3

CMSMB71/AP with CMP71S with belt transmission 57/47 ~ 1.21



Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm²]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 32x6	2000	100	6.4	3.4	19.2	17.0	15.67	16.43	13.02	14	33.5	3.48	128	6.0	21.7	24.2	26.2
		160					16.02	16.79	13.36							25.6	27.6
		200					16.24	17.02	13.58							26.5	28.5
		400					17.48	18.29	14.81							33.3	35.3
		600					18.63	19.46	15.94							37.9	39.9
		800					19.77	20.63	17.06							42.1	44.1
		1000					20.92	21.81	18.19							46.7	48.7
		1200					22.08	22.99	19.33							51.3	53.3
KGT 32x6	3000	100	6.4	4.9	19.2	25.0	15.67	16.43	13.02	14	15.7	1.48	87.5	6.0	21.7	24.2	26.2
		160					16.02	16.79	13.36							25.6	27.6
		200					16.24	17.02	13.58							26.5	28.5
		400					17.48	18.29	14.81							33.3	35.3
		600					18.63	19.46	15.94							37.9	39.9
		800					19.77	20.63	17.06							42.1	44.1
		1000					20.92	21.81	18.19							46.7	48.7
		1200					22.08	22.99	19.33							51.3	53.3
KGT 32x6	4500	100	6.4	7.3	19.2	38.0	15.67	16.43	13.02	14	7.1	0.72	59	6.0	21.7	24.2	26.2
		160					16.02	16.79	13.36							25.6	27.6
		200					16.24	17.02	13.58							26.5	28.5
		400					17.48	18.29	14.81							33.3	35.3
		600					18.63	19.46	15.94							37.9	39.9
		800					19.77	20.63	17.06							42.1	44.1
		1000					20.92	21.81	18.19							46.7	48.7
		1200					22.08	22.99	19.33							51.3	53.3
KGT 32x6	6000	100	6.4	9.6	19.2	50.0	15.67	16.43	13.02	14	4.15	0,395	45	6.0	21.7	24.2	26.2
		160					16.02	16.79	13.36							25.6	27.6
		200					16.24	17.02	13.58							26.5	28.5
		400					17.48	18.29	14.81							33.3	35.3
		600					18.63	19.46	15.94							37.9	39.9
		800					19.77	20.63	17.06							42.1	44.1
		1000					20.92	21.81	18.19							46.7	48.7
		1200					22.08	22.99	19.33							51.3	53.3

CMSB71M



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

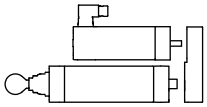
Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 32x6	2000	100	9.4	7.5	25.0[1] (30.8)[2]	18.8[3] (26.0)[2]	8.22	8.64	4.14	14	21.5	1.87	127	7.5	24	21.6	22.6
		160					8.59	9.01	4.51							23.0	25.0
		200					8.83	9.25	4.75							23.9	25.9
		400					10.15	10.57	6.07							30.7	31.7
		600					11.37	11.79	7.29							35.3	36.3
		800					12.59	13.01	8.51							39.5	40.5
		1000					13.82	14.24	9.74							44.1	45.1
		1200					15.04	15.46	10.96							48.7	49.7
KGT 32x6	3000	100	9.4	7.5	25.0[1] (30.8)[2]	27.0[3] (39.0)[2]	8.22	8.64	4.14	14	9.7	0.81	85	7.5	24	21.6	22.6
		160					8.59	9.01	4.51							23.0	25.0
		200					8.83	9.25	4.75							23.9	25.9
		400					10.15	10.57	6.07							30.7	31.7
		600					11.37	11.79	7.29							35.3	36.3
		800					12.59	13.01	8.51							39.5	40.5
		1000					13.82	14.24	9.74							44.1	45.1
		1200					15.04	15.46	10.96							48.7	49.7
KGT 32x6	4500	100	9.4	10.9	25.0[1] (30.8)[2]	39.2[3] (57.0)[2]	8.22	8.64	4.14	14	4.55	0,385	58	7.5	24	21.6	22.6
		160					8.59	9.01	4.51							23.0	25.0
		200					8.83	9.25	4.75							23.9	25.9
		400					10.15	10.57	6.07							30.7	31.7
		600					11.37	11.79	7.29							35.3	36.3
		800					12.59	13.01	8.51							39.5	40.5
		1000					13.82	14.24	9.74							44.1	45.1
		1200					15.04	15.46	10.96							48.7	49.7
KGT 32x6	6000	100	9.4	14.7	25.0[1] (30.8)[2]	52.9[3] (76.0)[2]	8.22	8.64	4.14	14	2.55	0,205	43.5	7.5	24	21.6	22.6
		160					8.59	9.01	4.51							23.0	25.0
		200					8.83	9.25	4.75							23.9	25.9
		400					10.15	10.57	6.07							30.7	31.7
		600					11.37	11.79	7.29							35.3	36.3
		800					12.59	13.01	8.51							39.5	40.5
		1000					13.82	14.24	9.74							44.1	45.1
		1200					15.04	15.46	10.96							48.7	49.7

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

CMSMB71/AP with CMP71M without belt transmission



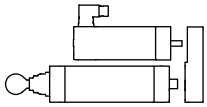
NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 32x6	2000	100	9.4	5.0	25.0 (30.8)	18.0 (26.0)	17.72	18.14	14.06	14	21.5	1.87	127	7.5	24	25.6	27.6
		160					18.09	18.51	14.43							27.0	29.0
		200					18.33	18.75	14.67							27.9	29.9
		400					19.65	20.07	15.99							34.7	36.7
		600					20.87	21.29	17.21							39.3	41.3
		800					22.09	22.51	18.43							43.5	45.5
		1000					23.31	23.73	19.65							48.1	50.1
		1200					24.54	24.96	20.88							52.7	54.7
KGT 32x6	3000	100	9.4	7.5	25.0 (30.8)	27.0 (39.0)	17.72	18.14	14.06	14	9.7	0.81	85	7.5	24	25.6	27.6
		160					18.09	18.51	14.43							27.0	29.0
		200					18.33	18.75	14.67							27.9	29.9
		400					19.65	20.07	15.99							34.7	36.7
		600					20.87	21.29	17.21							39.3	41.3
		800					22.09	22.51	18.43							43.5	45.5
		1000					23.31	23.73	19.65							48.1	50.1
		1200					24.54	24.96	20.88							52.7	54.7
KGT 32x6	4500	100	9.4	10.9	25.0 (38.8)	39.2 (57.0)	17.72	18.14	14.06	14	4.55	0,385	58	7.5	24	25.6	27.6
		160					18.09	18.51	14.43							27.0	29.0
		200					18.33	18.75	14.67							27.9	29.9
		400					19.65	20.07	15.99							34.7	36.7
		600					20.87	21.29	17.21							39.3	41.3
		800					22.09	22.51	18.43							43.5	45.5
		1000					23.31	23.73	19.65							48.1	50.1
		1200					24.54	24.96	20.88							52.7	54.7
KGT 32x6	6000	100	9.4	14.7	25.0 (38.8)	52.9 (76.0)	17.72	18.14	14.06	14	2.55	0,205	43.5	7.5	24	25.6	27.6
		160					18.09	18.51	14.43							27.0	29.0
		200					18.33	18.75	14.67							27.9	29.9
		400					19.65	20.07	15.99							34.7	36.7
		600					20.87	21.29	17.21							39.3	41.3
		800					22.09	22.51	18.43							43.5	45.5
		1000					23.31	23.73	19.65							48.1	50.1
		1200					24.54	24.96	20.88							52.7	54.7

CMSMB71/AP with CMP71M with belt transmission 57/47 ~ 1,21



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

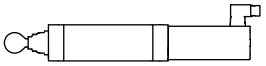
Spindle DxP	n_N [rpm]	Stroke length [mm]	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	J_{mot} [kgcm²]	J_{bmot} [kgcm²]	J_{zusatz} $J_{bzusatz}$ [kgcm²]	M_B [Nm]	L_1 [mH]	R_1 [Ω]	U_{p0kalt} [V]	F [kN]	F_{pk} [kN]	m [kg]	m_{bmot} [kg]
KGT 32x6	2000	100	9.4	5.0	20.7[1] (30.8)[2]	12.0[3] (26.0)[2]	16.65	17.07	12.99	14	21.5	1.87	127	7.5	24	25.6	27.6
		160					17.06	17.48	13.40							27.0	29.0
		200					17.33	17.75	13.67							27.9	29.9
		400					18.77	19.19	15.11							34.7	36.7
		600					20.12	20.54	16.46							39.3	41.3
		800					21.46	21.88	17.80							43.5	45.5
		1000					22.80	23.22	19.14							48.1	50.1
		1200					24.15	24.57	20.49							52.7	54.7
KGT 32x6	3000	100	9.4	7.5	20.7[1] (30.8)[2]	18.0[3] (39.0)[2]	16.65	17.07	12.99	14	9.7	0.81	85	7.5	24	25.6	27.6
		160					17.06	17.48	13.40							27.0	29.0
		200					17.33	17.75	13.67							27.9	29.9
		400					18.77	19.19	15.11							34.7	36.7
		600					20.12	20.54	16.46							39.3	41.3
		800					21.46	21.88	17.80							43.5	45.5
		1000					22.80	23.22	19.14							48.1	50.1
		1200					24.15	24.57	20.49							52.7	54.7
KGT 32x6	4500	100	9.4	10.9	20.7[1] (30.8)[2]	26.2[3] (57.0)[2]	16.65	17.07	12.99	14	4.55	0,385	58	7.5	24	25.6	27.6
		160					17.06	17.48	13.40							27.0	29.0
		200					17.33	17.75	13.67							27.9	29.9
		400					18.77	19.19	15.11							34.7	36.7
		600					20.12	20.54	16.46							39.3	41.3
		800					21.46	21.88	17.80							43.5	45.5
		1000					22.80	23.22	19.14							48.1	50.1
		1200					24.15	24.57	20.49							52.7	54.7
KGT 32x6	6000	100	9.4	14.7	20.7[1] (30.8)[2]	35.3[3] (76.0)[2]	16.65	17.07	12.99	14	2.55	0,205	43.5	7.5	24	25.6	27.6
		160					17.06	17.48	13.40							27.0	29.0
		200					17.33	17.75	13.67							27.9	29.9
		400					18.77	19.19	15.11							34.7	36.7
		600					20.12	20.54	16.46							39.3	41.3
		800					21.46	21.88	17.80							43.5	45.5
		1000					22.80	23.22	19.14							48.1	50.1
		1200					24.15	24.57	20.49							52.7	54.7

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

CMSB71L



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

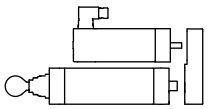
Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm^2]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 32x6	2000	100	13.1	6.3	25.0[1] (46.9)[2]	12.7[3] (39.0)[2]	10.32	10.74	4.14	14	16.2	1.2	142	10	24	24.6	25.6
		160					10.69	11.11	4.51							26.0	27.0
		200					10.93	11.35	4.75							26.9	27.9
		400					12.25	12.67	6.07							33.7	34.7
		600					13.47	13.89	7.29							38.3	39.3
		800					14.69	15.11	8.51							42.5	43.5
		1000					15.92	16.34	9.74							47.1	48.1
		1200					17.14	17.56	10.96							51.7	52.7
KGT 32x6	3000	100	13.1	9.4	25.0[1] (46.9)[2]	18.8[3] (58.0)[2]	10.32	10.74	4.14	14	7.3	0.56	96	10	24	24.6	25.6
		160					10.69	11.11	4.51							26.0	27.0
		200					10.93	11.35	4.75							26.9	27.9
		400					12.25	12.67	6.07							33.7	34.7
		600					13.47	13.89	7.29							38.3	39.3
		800					14.69	15.11	8.51							42.5	43.5
		1000					15.92	16.34	9.74							47.1	48.1
		1200					17.14	17.56	10.96							51.7	52.7
KGT 32x6	4500	100	13.1	14.1	25.0[1] (46.9)[2]	28.2[3] (87.0)[2]	10.32	10.74	4.14	14	3.25	0.24	64	10	24	24.6	25.6
		160					10.69	11.11	4.51							26.0	27.0
		200					10.93	11.35	4.75							26.9	27.9
		400					12.25	12.67	6.07							33.7	34.7
		600					13.47	13.89	7.29							38.3	39.3
		800					14.69	15.11	8.51							42.5	43.5
		1000					15.92	16.34	9.74							47.1	48.1
		1200					17.14	17.56	10.96							51.7	52.7
KGT 32x6	6000	100	13.1	18.8	25.0[1] (46.9)[2]	37.6[3] (115)[2]	10.32	10.74	4.14	14	1.84	0,145	48	10	24	24.6	25.6
		160					10.69	11.11	4.51							26.0	27.0
		200					10.93	11.35	4.75							26.9	27.9
		400					12.25	12.67	6.07							33.7	34.7
		600					13.47	13.89	7.29							38.3	39.3
		800					14.69	15.11	8.51							42.5	43.5
		1000					15.92	16.34	9.74							47.1	48.1
		1200					17.14	17.56	10.96							51.7	52.7

1) max. permitted torque

2) motor standard values

3) Max. permitted current

CMSMB71/AP with CMP71L without belt transmission



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

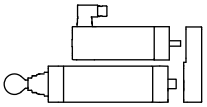
Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm^2]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 32x6	2000	100	13.1	6.3	25.0[1] (46.9)[2]	12.7[3] (39.0)[2]	19.82	20.24	14.06	14	16.2	1.2	142	10	24	28.6	30.6
		160					20.19	20.61	14.43							30.0	32.0
		200					20.43	20.85	14.67							30.9	32.9
		400					21.75	22.17	15.99							37.7	39.7
		600					22.97	23.39	17.21							42.3	44.3
		800					24.19	24.61	18.43							46.5	48.5
		1000					25.41	25.83	19.65							51.1	53.1
		1200					26.64	27.06	20.88							55.7	57.7
KGT 32x6	3000	100	13.1	9.4	25.0[1] (46.9)[2]	18.8[3] (58.0)[2]	19.82	20.24	14.06	14	7.3	0.56	96	10	24	28.6	30.6
		160					20.19	20.61	14.43							30.0	32.0
		200					20.43	20.85	14.67							30.9	32.9
		400					21.75	22.17	15.99							37.7	39.7
		600					22.97	23.39	17.21							42.3	44.3
		800					24.19	24.61	18.43							46.5	48.5
		1000					25.41	25.83	19.65							51.1	53.1
		1200					26.64	27.06	20.88							55.7	57.7
KGT 32x6	4500	100	13.1	14.1	25.0[1] (46.9)[2]	28.2[3] (87.0)[2]	19.82	20.24	14.06	14	3.25	0.24	64	10	24	28.6	30.6
		160					20.19	20.61	14.43							30.0	32.0
		200					20.43	20.85	14.67							30.9	32.9
		400					21.75	22.17	15.99							37.7	39.7
		600					22.97	23.39	17.21							42.3	44.3
		800					24.19	24.61	18.43							46.5	48.5
		1000					25.41	25.83	19.65							51.1	53.1
		1200					26.64	27.06	20.88							55.7	57.7
KGT 32x6	6000	100	13.1	18.8	25.0[1] (46.9)[2]	37.6[3] (115)[2]	19.82	20.24	14.06	14	1.84	0,145	48	10	24	28.6	30.6
		160					20.19	20.61	14.43							30.0	32.0
		200					20.43	20.85	14.67							30.9	32.9
		400					21.75	22.17	15.99							37.7	39.7
		600					22.97	23.39	17.21							42.3	44.3
		800					24.19	24.61	18.43							46.5	48.5
		1000					25.41	25.83	19.65							51.1	53.1
		1200					26.64	27.06	20.88							55.7	57.7

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

CMSMB71/AP with CMP71L with belt transmission 57/47 ~ 1.21



NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz} $J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm²]			[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 32x6	2000	100	13.1	6.3	20.7[1] (46.9)[2]	10.7[3] (39.0)[2]	18.75	19.17	15.09	14	16.2	1.2	142	12	24	28.6	30.6
		160					19.16	19.58	15.50							30.0	32.0
		200					19.43	19.85	15.77							30.9	32.9
		400					20.87	21.29	17.21							37.7	39.7
		600					22.22	22.64	18.56							42.3	44.3
		800					23.56	23.98	19.90							46.5	48.5
		1000					24.90	25.32	21.24							51.1	53.1
		1200					26.25	26.67	22.59							57.7	55.7
KGT 32x6	3000	100	13.1	9.4	20.7[1] (46.9)[2]	16.0[3] (58.0)[2]	18.75	19.17	15.09	14	7.3	0.56	96	12	24	28.6	30.6
		160					19.16	19.58	15.50							30.0	32.0
		200					19.43	19.85	15.77							30.9	32.9
		400					20.87	21.29	17.21							37.7	39.7
		600					22.22	22.64	18.56							42.3	44.3
		800					23.56	23.98	19.90							46.5	48.5
		1000					24.90	25.32	21.24							51.1	53.1
		1200					26.25	26.67	22.59							55.7	57.7
KGT 32x6	4500	100	13.1	14.1	20.7[1] (46.9)[2]	24.0[3] (87.0)[2]	18.75	19.17	15.09	14	3.25	0.24	64	12	24	28.6	30.6
		160					19.16	19.58	15.50							30.0	32.0
		200					19.43	19.85	15.77							30.9	32.9
		400					20.87	21.29	17.21							37.7	39.7
		600					22.22	22.64	18.56							42.3	44.3
		800					23.56	23.98	19.90							46.5	48.5
		1000					24.90	25.32	21.24							51.1	53.1
		1200					26.25	26.67	22.59							55.7	57.7
KGT 32x6	6000	100	13.1	18.8	20.7[1] (46.9)[2]	32.0[3] (115)[2]	18.75	19.17	15.09	14	1.84	0,145	48	12	24	28.6	30.6
		160					19.16	19.58	15.50							30.0	32.0
		200					19.43	19.85	15.77							30.9	32.9
		400					20.87	21.29	17.21							37.7	39.7
		600					22.22	22.64	18.56							42.3	44.3
		800					23.56	23.98	19.90							46.5	48.5
		1000					24.90	25.32	21.24							51.1	53.1
		1200					26.25	26.67	22.59							55.7	57.7

1) Max. permitted torque

2) Standard motor values

3) Max. permitted current

8.6 CMS71L

8.6.1 Features

Design	Standard	Optional
Degree of protection	IP45 (IP65)[1)]	
Motor protection	TF	KTY/TH
Mounting position	any	
Cooling	Natural convection	
Lubrication	Fixed lubrication point with taper greasing nipple DIN 71412-A	Lubricator, chapter 7.6
Spindle protection	Bellows	

1) for electrical components

8.6.2 CMS71L

The following tables show the technical data.

INFORMATION

Stroke length 200 mm → n_{epk} = 3000 rpm (max. mechanical speed)

Stroke length 350 mm → n_{epk} = 2000 rpm (max. mechanical speed)

NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle	n_N	Stroke length	M_0	I_0	M_{pk}	I_{max}	J_{mot}	J_{bmot}	J_{zusatz}	$J_{bzusatz}$	M_B	L_1	R_1	U_{p0kalt}	F	F_{pk}	m	m_{bmot}
DxP	[rpm]	[mm]	[Nm]	[A]	[Nm]	[A]	[kgcm²]				[Nm]	[mH]	[Ω]	[V]	[kN]		[kg]	
KGT 32x6	2000	200	9.5	4.2	22.1[1)] (31.4)[2)]	9.2[3)] (16.8)[2)]	32.5	37.5	23.3	26.6	19	24	2.5	151	6.7	20	19	20
		350		4.2	16.6[1)] (31.4)[2)]	7.3[3)](16.8)[2)]	45.3	50.3	36.1	39.4		24	2.5	151		15[4)]	25	26
	3000	200		6.2	22.1[1)] (31.4)[2)]	13.6[3)] (25)[2)]	32.5	37.5	23.3	26.6		11	1.12	102		20	19	20
		350		6.2	16.6[1)] (31.4)[2)]	10.8[3)](25)[2)]	45.3	50.3	36.1	39.4		11	1.12	102		15[4)]	25	26
	4500	200		9.6	22.1[1)] (31.4)[2)]	21.1[3)] (38)[2)]	32.5	37.5	23.3	26.6		4.5	0.5	65		20	19	20
		350		9.6	16.6[1)] (31.4)[2)]	16.8[3)] (38)[2)]	45.3	50.3	36.1	39.4		4.5	0.5	65		15[4)]	25	26
KGT 32x10	2000	200	9.5	4.2	31.4	16.8	32.5	37.5	23.3	26.6	19	24	2.5	151	3.6	17	19	20
	3000	200		6.2		25						11	1.12	102				
	4500	200		9.6		38						4.5	0.5	65				
PGT 24x5	2000	200	9.5	4.2	24.4[1)] (31.4)[2)]	10.5[3)] (16.8)[2)]	32.5	37.5	23.3	26.6	19	24	2.5	151	7.2	20	19	20
	3000	200		6.2		15.5[3)] (25)[2)]						11	1.12	102				
	4500	200		9.6		24[3)] (38)[2)]						4.5	0.5	65				

1) max. permitted torque
2) motor standard values
3) Max. permitted current
4) In case of tensile loads, a peak feed force Fpk of 20 kN is possible

8.7 Linear units

The following chapters list the technical data of the linear units CMSMB63 and CMSMB71 without drive.

8.7.1 CMSMB63 /ACH /ACA

NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle DxP	$n_{e\ pk}$ [rpm]	Stroke length [mm]	M_{pk} [Nm]	J /ACH / ACA [kgcm^2]	F_{pk} [kN]	m [kg]
KGT 25x6	4500	100	11.1	0.95	10	7.1
		160		1.08		8.0
		180		1.13		8.3
		200		1.17		8.7
		400		1.67		12.9
		600		2.13		16.2

8.7.2 CMSMB71 /ACH /ACA

NOTICE

Take into account the maximum permitted torque M_{pk}.

A current limitation is required on the frequency inverter

Spindle DxP	$n_{e\ pk}$ [rpm]	Stroke length [mm]	M_{pk} [Nm]	J /ACH / ACA [kgcm^2]	F_{pk} [kN]	m [kg]
KGT 32x6	4500	100	25.0	5.89	24	15.4
		160		6.26		16.8
		200		6.50		17.7
		400		7.82		24.5
		600		9.04		29.1
		800		10.27		33.3
		1000		11.49		37.9
		1200		12.71		42.5

8.8 Forced cooling fan

The table below shows the technical data of the CMS with forced cooling fan option.

CMS50 CMSB63/71 /ACA /ACH CMSMB63/71 /ACA /ACH	n_N [rpm]	M_{0VR} [Nm]	F_{0VR} [N]	I_{0VR} [A]
CMS50S	3000	1.7	1500	1.26
CMS50S	4500	1.7	1500	1.7
CMS50S	6000	1.7	1500	2.2
CMS50M	3000	2.8	2500	2.0
CMS50M	4500	2.8	2500	2.7
CMS50M	6000	2.8	2500	3.5
CMSB63S	3000	3.8	3000	2.8
CMSB63S	4500	3.8	3000	4.0
CMSB63S	6000	3.8	3000	5.1
CMSB63M	3000	7.1	5500	4.8
CMSB63M	4500	7.1	5500	7.2
CMSB63M	6000	7.1	5500	9.2
CMSB63L	3000	9.7	7500	6.8
CMSB63L	4500	9.7	7500	9.5
CMSB63L	6000	9.7	7500	12.7
CMSB71S	2000	8.3	6400	4.4
CMSB71S	3000	8.3	6400	6.4
CMSB71S	4500	8.3	6400	9.5
CMSB71S	6000	8.3	6400	12.5
CMSB71M	2000	12.6	9700	6.7
CMSB71M	3000	12.6	9700	10.1
CMSB71M	4500	12.6	9700	14.6
CMSB71M	6000	12.6	9700	19.7
CMSB71L	2000	17.9	13800	8.6
CMSB71L	3000	17.9	13800	12.9
CMSB71L	4500	17.9	13800	19.3
CMSB71L	6000	17.9	13800	25.8

Table continued on next page

CMSMB63/71 /AP without transmission	n_N [rpm]	M_{0VR} [Nm]	F_{0VR} [N]	I_{0VR} [A]
CMSB63S	3000	3.8	2900	2.8
CMSB63S	4500	3.8	2900	4.0
CMSB63S	6000	3.8	2900	5.1
CMSB63M	3000	7.7	6000	5.2
CMSB63M	4500	7.7	6000	7.8
CMSB63M	6000	7.7	6000	10.0
CMSB63L	3000	9.7	7500	6.8
CMSB63L	4500	9.7	7500	9.5
CMSB63L	6000	9.7	7500	12.7
CMSB71S	2000	8.3	6400	4.4
CMSB71S	3000	8.3	6400	6.4
CMSB71S	4500	8.3	6400	9.5
CMSB71S	6000	8.3	6400	12.5
CMSB71M	2000	12.6	9600	6.7
CMSB71M	3000	12.6	9600	10.1
CMSB71M	4500	12.6	9600	14.6
CMSB71M	6000	12.6	9600	19.7
CMSB71L	2000	17.9	13500	8.6
CMSB71L	3000	17.9	13500	12.9
CMSB71L	4500	17.9	13500	19.3
CMSB71L	6000	17.9	13500	25.8

CMSMB63/71 /AP with transmission	n_N [rpm]	M_{0VR} [Nm]	F_{0VR} [N]	I_{0VR} [A]
CMSB63S	3000	3.8	4700	2.8
CMSB63S	4500	3.8	4700	4.0
CMSB63S	6000	3.8	4700	5.1
CMSB63M	3000	7.7	9800	5.2
CMSB63M	4500	7.7	9800	7.8
CMSB63M	6000	7.7	9800	10.0
CMSB63L	3000	9.7	12200	6.8
CMSB63L	4500	9.7	12200	9.5
CMSB63L	6000	9.7	12200	12.7
CMSB71S	2000	8.3	7700	4.4
CMSB71S	3000	8.3	7700	6.4
CMSB71S	4500	8.3	7700	9.5
CMSB71S	6000	8.3	7700	12.5
CMSB71M	2000	12.6	11500	6.7
CMSB71M	3000	12.6	11500	10.1
CMSB71M	4500	12.6	11500	14.6
CMSB71M	6000	12.6	11500	19.7
CMSB71L	2000	17.9	16200	8.6
CMSB71L	3000	17.9	16200	12.9
CMSB71L	4500	17.9	16200	19.3
CMSB71L	6000	17.9	16200	25.8

8.9 Brakes BP / BS

The standard voltage supply of the brakes is DC 24 V and they operate with a constant braking torque. The brakes cannot be retrofitted and can operate without brake rectifier or brake control unit. Observe the maximum currents of the brakes when connecting them. Overvoltage protection must be implemented by the customer, for example using varistors.

The brakes can be used at all speeds.

The brakes are released electrically and are applied once the voltage is disconnected.

NOTICE

The BS brake of CMS71L will not function if the polarity is incorrect.

Possible damage to property.

- Make sure the polarity is correct.

INFORMATION

- Comply with the applicable regulations issued by the relevant employer's liability insurance association regarding phase failure protection and the associated circuit/circuit modification!
- In view of the DC voltage to be switched and the high level of current load, it is essential to use either special brake contactors or AC contactors with contacts in utilization category AC-3 according to EN 60947-4-1.

The mechanical brake is not used as service brake but as emergency brake or holding brake for general machine standstill.

Observe the notes in the relevant operating instructions for servo inverters concerning the switching sequence of motor enable and brake control during standard operation.

8.9.1 Brake assignment, technical data

The following table shows the technical data of the brakes.

Motor type	Brake type	V_N [V_{DC}]	R [Ω]	I [A]	P [W]	M_B [Nm]	t_1 [10^{-3} s]	t_2 [10^{-3} s]
CMS50S/M	**BP04**	24	56.5	0.42	10.2	4.3	60	15
CMSB63S/M	**BP09**		35	0.67	16	9.3	60	15
CMSMB63S/M/L								
CMSB71S/M/L	**BP1**		29.4	0.81	19.5	14	80	15
CMSMB71S/M/L								
CMS71L	**BS2**		34	0.71	17	19	120	120

M_B = Braking torque
P = Power consumption of the coil
t_1 = Response time
t_2 = Application time
I = Operating current 20 °C
R = Coil resistance
V_N = nominal voltage ± 10 %

INFORMATION

The response and application times of the brakes in the above tables do not take account of customer installations.

8.9.2 Maximum possible holding forces without safety

Electric cylinder	Spindle pitch [mm]	Threaded spindle	Holding force [N]
CMS50.	5	KGT	5500
CMSB63 CMSMB63	6	KGT	10000
CMSB71 CMSMB71	6	KGT	15000
CMS71L	6	KGT	20000
CMS71L	10	KGT	12500
CMS71L	5	PGT	29000

8.10 Encoder systems

The following encoder systems are used for electric cylinders:

8.10.1 Resolver

RH1M	
Number of poles	2
Primary	Rotor
Input voltage	7 V
Input frequency	7 kHz
Reduction ratio ± 10 %	0.5
Phase shift ± 5°	+13°
Input impedance ± 15 %	130 + j120 Ω
Output impedance ± 15 %	200 + j270 Ω
Input resistance ± 10 %	82 Ω
Output resistance ± 10 %	68 Ω
Maximum electrical fault	± 6"
Temperature range	-55 °C to +150 °C

8.10.2 Hiperface® encoder

/ES1H, /AS1H, /AK0H

SEW-EURODRIVE offers Hiperface® encoders as an alternative to the resolver.

Type **CMS50S/M and CMS63S/M** **CMS71L**	**ES1H**	**AS1H**	**AK0H**	**EK1H**	**AK1H**
Supply voltage	DC 7 - 8 - 12 V polarity reversal protected				
Max. current consumption	140 mA		120 mA	140 mA	
Maximum operating frequency	200 kHz		26 kHz	200 kHz	
Pulses (sine cycles) per revolution	1024		128	1024	
Output amplitude per track	0.9 - 1.1 V_{pp} sin/cos		0.8 – 1.1 V_{pp} sin/cos	0.9 – 1.1 V_{pp} sin/cos	
Single-turn resolution	32768 increments/revolution (15 bits)		4096 increments/revolution (15 bits)	32768 increments/revolution (15 bits)	
Multi-turn resolution	–	4096 revolutions (12 bits)		–	4096 revolutions (12 bits)
Transmission protocol	Hiperface®				
Serial data output	Driver according to EIA RS-485				
Vibration resistance (10-2000 Hz)	≤ 200 m/s^2 (DIN IEC 68-2-6)		≤ 100 m/s^2 (DIN IEC 68-2-6)	≤ 200 m/s^2 (DIN IEC 68-2-6)	
Maximum speed	12000 rpm		9000 rpm	12000 rpm	
Connection	12-pin round connector				
Temperature range	-20 °C to +110 °C				

8.11 Lubricator

8.11.1 Star Control Time (ST)

Cable design

Cable cross section	Litz structure	Insulation	Outer cable jacket material
4 x 0,25 mm^2	Cu litz wire 32 x ¬ 0.1 mm blk	PVC ¬ 1.3 + 0.05, wall thickness ca.0.32 mm	PUR / black

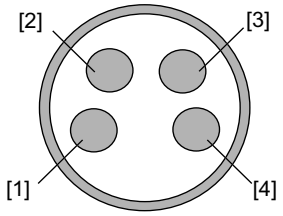
Characteristic data

Conductor resistance	permitted temperature	Outputs
79.9 Ω / km at 20 °C	In standstill: -25 – +70°C In motion: -5 – +70°C	max. 400 mA each, short-circuit-proof

- The cable is approved for cable carriers, for the smallest bending radius 60 mm.
- Voltage supply 15 to 25 VDC (max. 30 VDC, 5% residual ripple) must be applied for at least 3 minutes in order to ensure the correct runtime. Current consumption typically 0.2 A (inrush current can be up to 1.2 A). The maximum load per output (pin 2 and 4) must not exceed 400 mA.

Pin assignment

Pin assignment of the connector on the lubricator:



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Pin assignment	Cable color	Signal
[1]	Brown	Voltage supply +
[2]	White	LED green digital (output)
[3]	Blue	Voltage supply -
[4]	Black	LED red digital (output)

8.11.2 Star Control Impulse (SI)

Cable design

Cable cross section	Litz structure	Insulation	Outer cable jacket material
4 x 0,25 mm^2	Cu litz wire 32 x ¬ 0.1 mm blk	PVC ¬ 1.3 + 0.05, wall thickness ca.0.32 mm	PUR / black

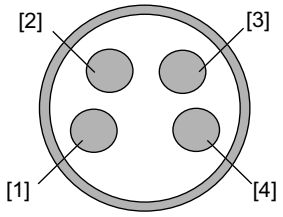
Characteristic data

Conductor resistance	permitted temperature	Outputs
79.9 Ω / km at 20°C	In standstill: -25 – +70°C In motion: -5 – +70°C	max. 400 mA each, short-circuit-proof

- The cable is approved for cable carriers, for the smallest bending radius 60 mm.
- Voltage supply 15 to 25 VDC (max. 30 VDC, 5% residual ripple) must be applied throughout the dispensing process in order to ensure the correct runtime. Current consumption typically 0.2 A (inrush current can be up to 1.2 A). The maximum load per output (pin 2 and 4) must not exceed 400 mA.

Pin assignment

Pin assignment of the connector on the lubricator:



6927044619

Pin assignment	Cable color	Signal
[1]	Brown	Voltage supply +
[2]	White	LED green digital (output)
[3]	Blue	Voltage supply -
[4]	Black	LED red digital (output)

9 Malfunctions

9.1 Notes

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the electric cylinder before you start working on the unit.
- Safeguard the electric cylinder against unintentional restart.

⚠ WARNING

In hoist applications, note that the load torque of the application to be held in place must be less than the holding torque of the brake used.

Severe or fatal injuries.

- Observe the project planning guidelines.
- The spindles that are used are not self-locking.

⚠ NOTICE

The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.

NOTICE

Improper troubleshooting may result in damages to the electric cylinder.

Possible damage to property.

- Note the following information.

- Components may be subject to mechanical loads. Support and secure the customer structure before removing the electric cylinder.
- Use only genuine spare parts in accordance with the valid parts list.
- Strictly observe the safety notes in the individual chapters.

9.2 Customer service

Please have the following information available if you require customer service assistance:

- Complete nameplate data
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- A digital photograph if possible

9.3 Malfunctions of the electric cylinder

Malfunction	Possible cause	Remedy
Electric cylinder does not start	Supply cable interrupted	Check connections, correct if necessary
	Fuse blown	Replace fuse
	Motor protection tripped	Check motor protection for correct setting, correct fault if necessary
	Servo inverter faulty, overloaded, incorrectly wired or incorrectly set	Check servo inverter, check wiring
Incorrect direction of rotation	Electric cylinder connected incorrectly	Check servo inverter, check setpoints
Electric cylinder hums and has high current consumption	Drive is blocked	Check drive
	Brake does not release	→ Chapter "Brake faults"
	Encoder cable malfunction	Check encoder cable
Electric cylinder heats up excessively (measure temperature)	Overload	Measure the power, use larger motor or reduce load if necessary
	Insufficient cooling	Correct cooling air supply or clear cooling air passages, retrofit forced cooling fan or use water cooling if necessary
	Ambient temperature too high	Observe permitted temperature range
	Nominal duty cycle (S1 to S10, DIN 57530) exceeded, e.g. caused by excessive starting frequency	Adjust the nominal duty cycle of the motor to the required operating conditions; consult a professional to determine the proper drive, if necessary
Running noise on electric cylinder	Bearing damage/spindle damage	Contact SEW-EURODRIVE customer service
Position of the piston rod does not match the controller specification or changes independently	mechanical damages to the CMS internally	Contact SEW-EURODRIVE customer service

9.4 Inverter malfunctions

INFORMATION

Operating the electric cylinder with an inverter may also cause the described malfunctions (page 111). Please refer to the inverter operating instructions for the meaning of the problems that occur and to find information about rectifying the problems.

Please have the following information to hand if you require the assistance of our customer service:

- Complete nameplate data
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- Digital photo if possible

9.5 Brake malfunctions

Malfunction	Possible cause	Remedy
Brake does not release	Incorrect operating voltage on the brake	• Apply correct voltage • Reversed polarity, only for BS2 brake
	Max. permitted working air gap exceeded because brake lining worn down.	Contact SEW-EURODRIVE customer service
	Voltage drop along supply cable > 10 %	Ensure correct connection voltage; check cable cross section
	Brake coil has interturn short circuit or a short circuit to frame	Contact SEW-EURODRIVE customer service
Motor does not brake	Brake lining worn	Contact SEW-EURODRIVE customer service
	Incorrect braking torque.	
Brake worn	Brake release times incorrect	Adjust brake release times to startup and deceleration processes

9.6 Disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components

Dispose of all components in accordance with applicable regulations.

10 Address List

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	**Mechanics / Mechatronics**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
Drive Technology Center	**North**	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357 14 euro cents/min on the German landline network. Max 42 euro cents/min from a German mobile network. Prices for mobile and international calls may differ.
	Additional addresses for service in Germany provided on request!		

France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Production	**Forbach**	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15

France			
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

Algeria			
Sales	**Algiers**	REDUCOM Sarl 16, rue des Frères Zaghnoune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 info@reducom-dz.com http://www.reducom-dz.com

Argentina			
Assembly **Sales**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at

Belarus			
Sales	**Minsk**	SEW-EURODRIVE BY RybalkoStr. 26 BY-220033 Minsk	Tel.+375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by

Belgium			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	**Industrial Gears**	**SEW-EURODRIVE n.v./s.a.** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be

Brazil			
Production **Sales** **Service**	**São Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 152 - Rodovia Presidente Dutra Km 208 Guarulhos - 07251-250 - SP SAT - SEW ATENDE - 0800 7700496	Tel. +55 11 2489-9133 Fax +55 11 2480-3328 http://www.sew-eurodrive.com.br sew@sew.com.br

Brazil			
Assembly **Sales** **Service**	**Rio Claro**	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
	Indaiatuba	SEW-EURODRIVE Brasil Ltda. Estrada Municipal Jose Rubim, 205 Rodovia Santos Dumont Km 49 13347-510 - Indaiatuba / SP	Tel. +55 19 3835-8000 sew@sew.com.br

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 33 431137 Fax +237 33 431137 electrojemba@yahoo.fr

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 info@sew-eurodrive.cn http://www.sew-eurodrive.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn

China			
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
	Additional addresses for service in China provided on request!		

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr

Czech Republic			
Sales **Assembly** **Service**	**Hostivice**	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
	Drive Service Hotline / 24 Hour Service	HOT-LINE +420 800 739 739 (800 SEW SEW)	**Servis:** Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Copenhagen**	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Egypt			
Sales **Service**	**Cairo**	Copam Egypt for Engineering & Agencies 33 EI Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 +1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production **Assembly**	**Karkkila**	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate Normanton West Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911

Greece			
Sales	**Athens**	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu

India			
Registered Office **Assembly** **Sales** **Service**	**Vadodara**	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200, +91 265 2831086 Fax +91 265 3045300, +91 265 2831087 http://www.seweurodriveindia.com salesvadodara@seweurodrivein-dia.com
Assembly **Sales** **Service**	**Chennai**	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Solaro**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Société Industrielle & Commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1173 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Kazakhstan			
Sales	**Almaty**	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz

Kenya			
Sales	**Nairobi**	Barico Maintenances Ltd Kamutaga Place Commercial Street Industrial Area P.O.BOX 52217 - 00200 Nairobi	Tel. +254 20 6537094/5 Fax +254 20 6537096 info@barico.co.ke

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales Lebanon	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
		After Sales Service	service@medrives.com

Lebanon			
Sales Jordan / Kuwait / Saudi Arabia / Syria	**Beirut**	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 info@medrives.com http://www.medrives.com
		After Sales Service	service@medrives.com

Lithuania			
Sales	**Alytus**	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 irmantas@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.lu info@sew-eurodrive.be

Madagascar			
Sales	**Antananarivo**	Ocean Trade BP21bis. Andraharo Antananarivo. 101 Madagascar	Tel. +261 20 2330303 Fax +261 20 2330330 oceantrabp@moov.mg

Malaysia			
Assembly **Sales** **Service**	**Johor**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my

Mexico			
Assembly **Sales** **Service**	**Quéretaro**	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales **Service**	**Mohammedia**	SEW-EURODRIVE SARL 2 bis, Rue Al Jahid 28810 Mohammedia	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 sew@sew-eurodrive.ma http://www.sew-eurodrive.ma

Namibia			
Sales	**Swakopmund**	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 sales@dbmining.in.na

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Nigeria			
Sales	**Lagos**	EISNL Engineering Solutions and Drives Ltd Plot 9, Block A, Ikeja Industrial Estate (Ogba Scheme) Adeniyi Jones St. End Off ACME Road, Ogba, Ikeja, Lagos Nigeria	Tel. +234 (0)1 217 4332 team.sew@eisnl.com http://www.eisnl.com

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Pakistan			
Sales	**Karachi**	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 6765332 / 42 6765343 Fax +48 42 6765346	Linia serwisowa Hotline 24H Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucharest**	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 RUS-195220 St. Petersburg	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV sprat SRB-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive-com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za

South Africa			
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Korea			
Assembly **Sales** **Service**	**Ansan**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate #1048-4, Shingil-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Swaziland			
Sales	**Manzini**	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sanayi Ticaret Limited Şirketi Gebze Organize Sanayi Bölgesi 400.Sokak No:401 TR-41480 Gebze KOCAELİ	Tel. +90-262-9991000-04 Fax +90-262-9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

Ukraine			
Assembly **Sales** **Service**	**Dnipropetrovsk**	ООО «СЕВ-Евродрайв» ул.Рабочая, 23-В, офис 409 49008 Днепропетровск	Тел. +380 56 370 3211 Факс. +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

United Arab Emirates			
Sales **Service**	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae

USA			
Production **Assembly** **Sales** **Service**	**Southeast Region**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**Northeast Region**	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net

Vietnam			
Sales	**Ho Chi Minh City**	**All sectors except harbor, steel, coal power and offshore:** Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn
		Harbor and offshore: DUC VIET INT LTD Industrial Trading and Engineering Services A75/6B/12 Bach Dang Street, Ward 02, Tan Binh District, 70000 Ho Chi Minh City	Tel. +84 8 62969 609 Fax +84 8 62938 842 totien@ducvietint.com
		Coal power and steel: Thanh Phat Co Ltd DMC Building, L11-L12, Ward3, Binh Thanh Dist, Ho Chi Minh City	Tel. +84 835170381 Fax +84 835170382 sales@thanh-phat.com
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